FIG. 1

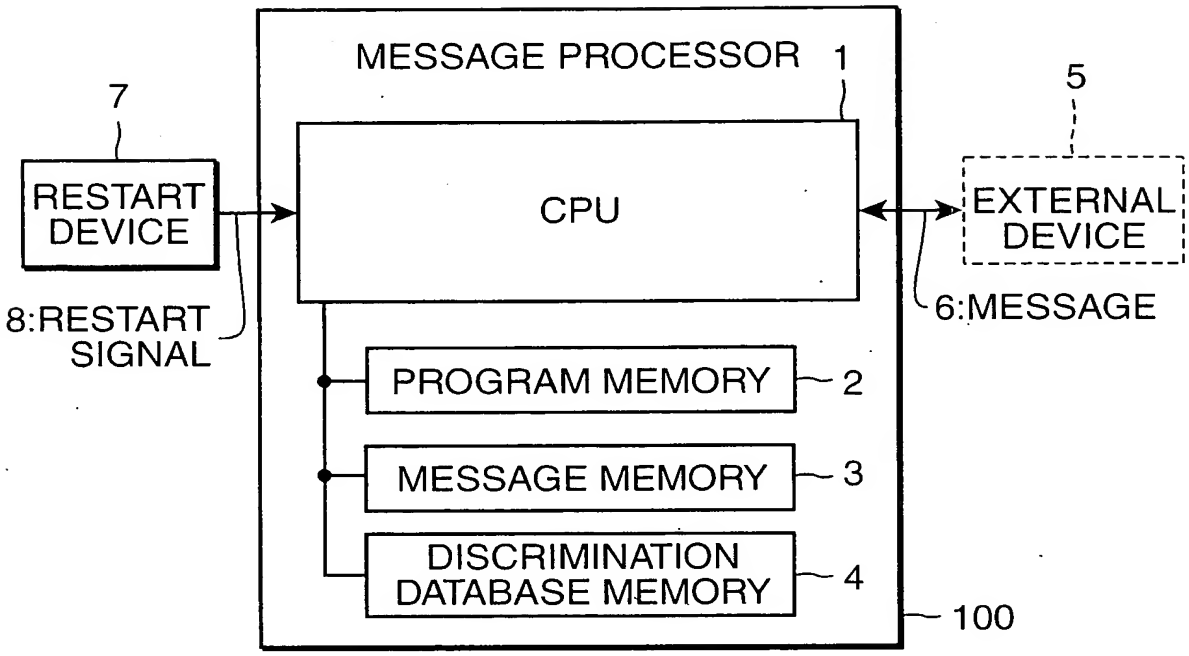

MESSAGE PROCESSOR
1
7
RESTART DEVICE
8:RESTART SIGNAL
CPU
5
EXTERNAL DEVICE
6:MESSAGE
PROGRAM MEMORY
2
MESSAGE MEMORY
3
DISCRIMINATION DATABASE MEMORY
4
100

FIG. 2

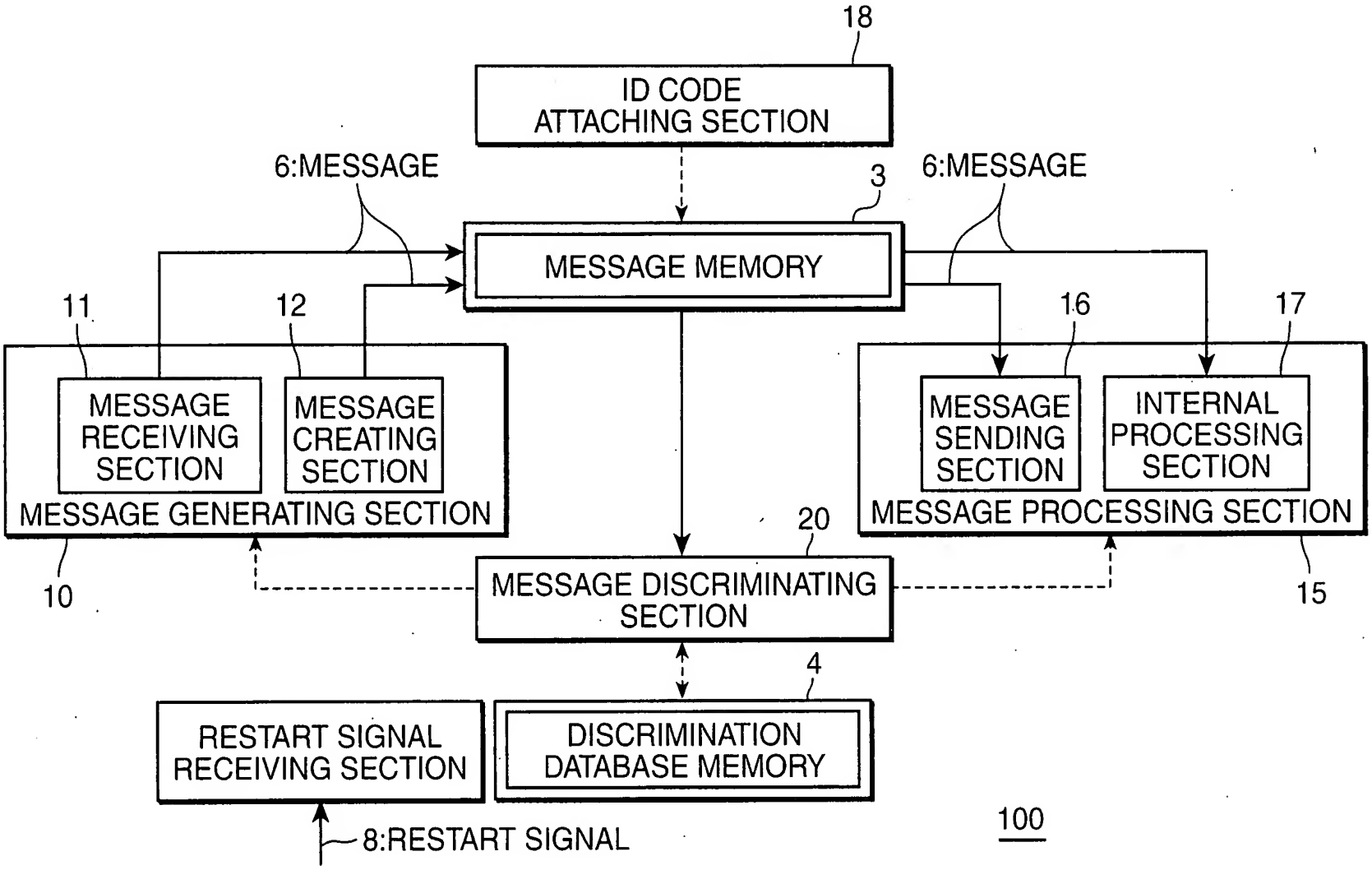

18
ID CODE ATTACHING SECTION
6:MESSAGE
3
6:MESSAGE
MESSAGE MEMORY
11
12
16
17
MESSAGE RECEIVING SECTION
MESSAGE CREATING SECTION
MESSAGE GENERATING SECTION
MESSAGE SENDING SECTION
INTERNAL PROCESSING SECTION
MESSAGE PROCESSING SECTION
20
10
MESSAGE DISCRIMINATING SECTION
15
4
RESTART SIGNAL RECEIVING SECTION
DISCRIMINATION DATABASE MEMORY
8:RESTART SIGNAL
100

FIG. 3

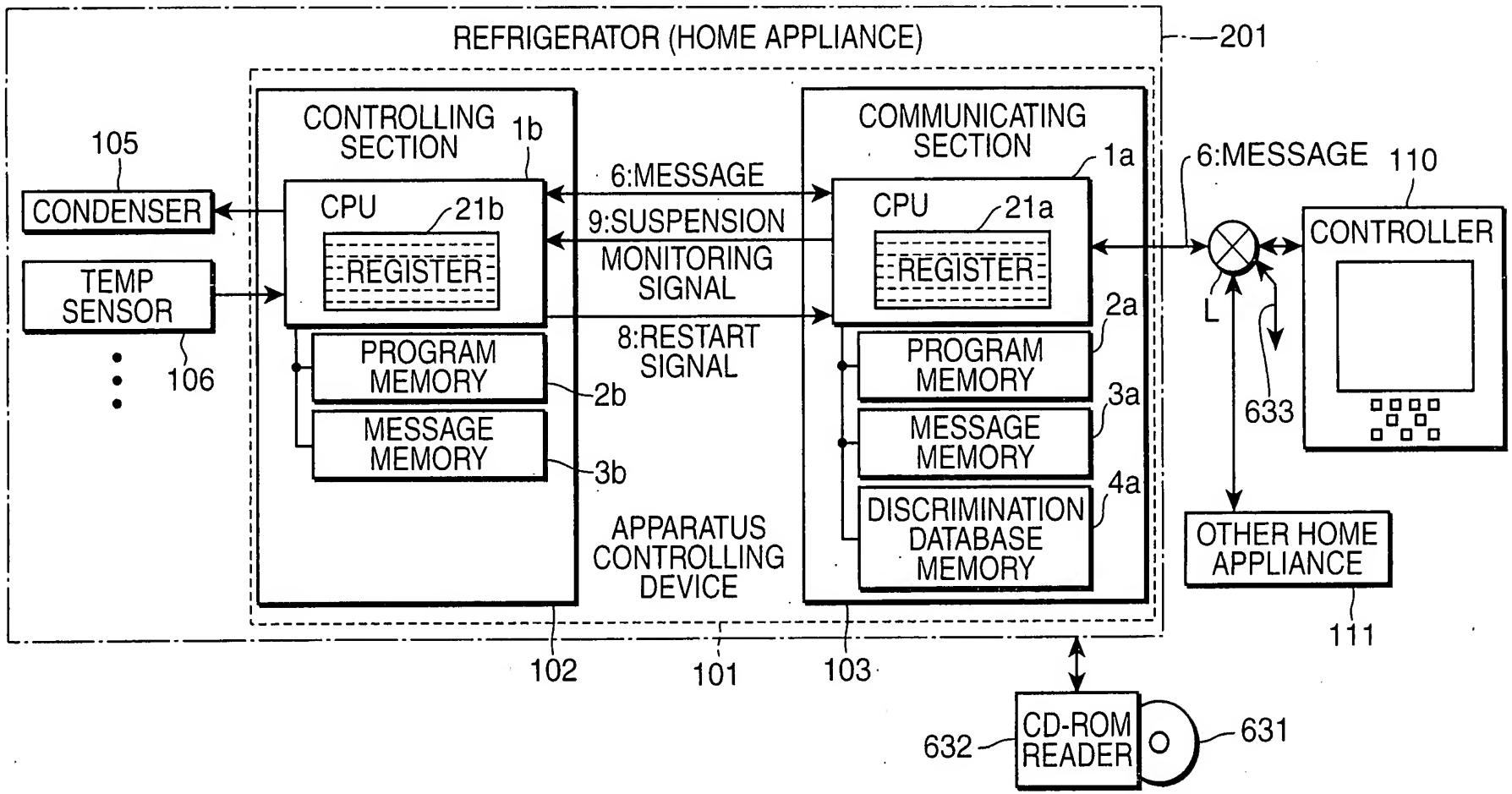

REFRIGERATOR (HOME APPLIANCE)
201
CONTROLLING SECTION
1b
COMMUNICATING SECTION
1a
105
CONDENSER
TEMP SENSOR
106
CPU
21b
REGISTER
PROGRAM MEMORY
2b
MESSAGE MEMORY
3b
6:MESSAGE
9:SUSPENSION
MONITORING SIGNAL
8:RESTART SIGNAL
APPARATUS CONTROLLING DEVICE
CPU
21a
REGISTER
2a
PROGRAM MEMORY
3a
MESSAGE MEMORY
4a
DISCRIMINATION DATABASE MEMORY
6:MESSAGE
110
CONTROLLER
L
633
OTHER HOME APPLIANCE
111
102
101
103
CD-ROM READER
632
631

FIG. 4

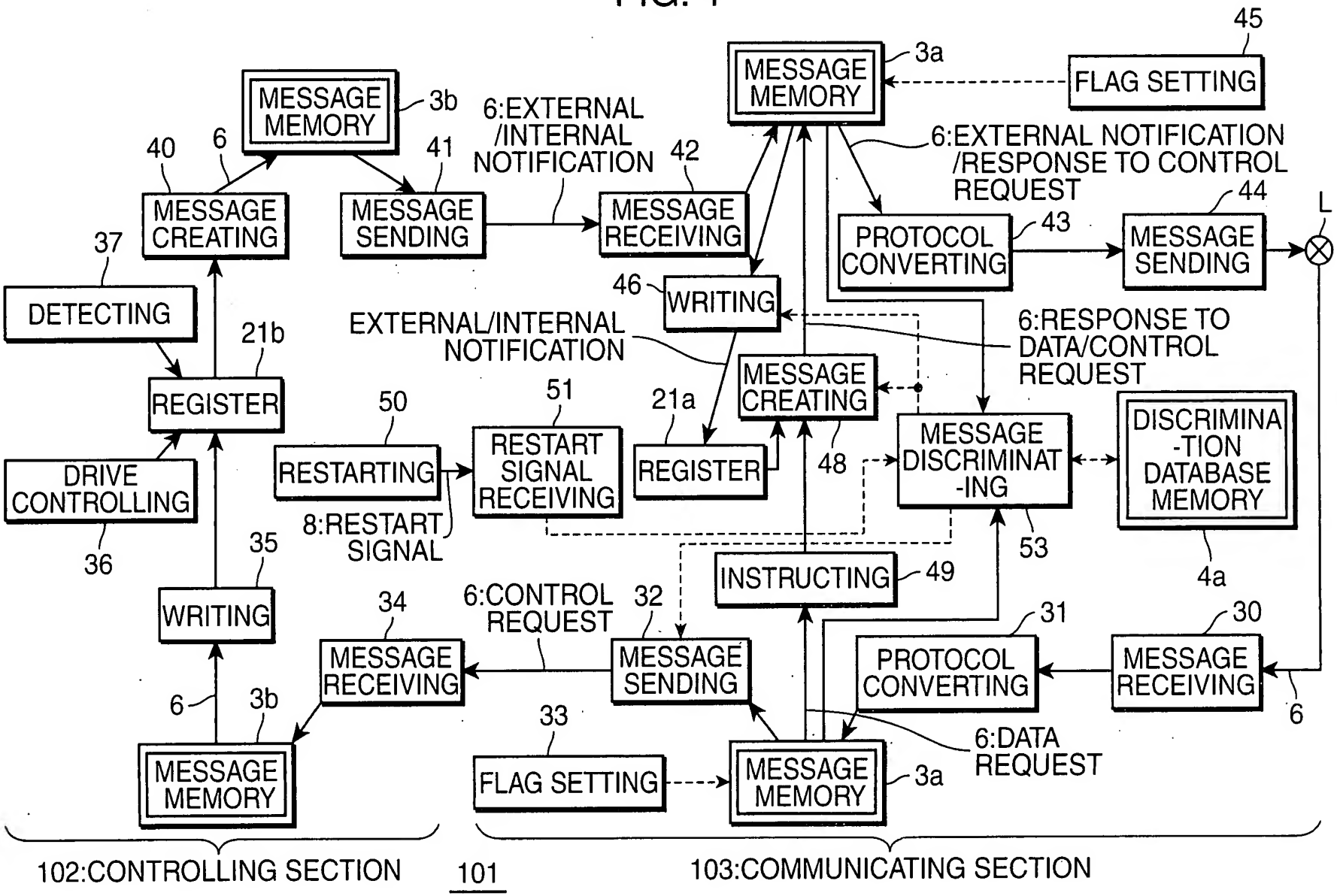
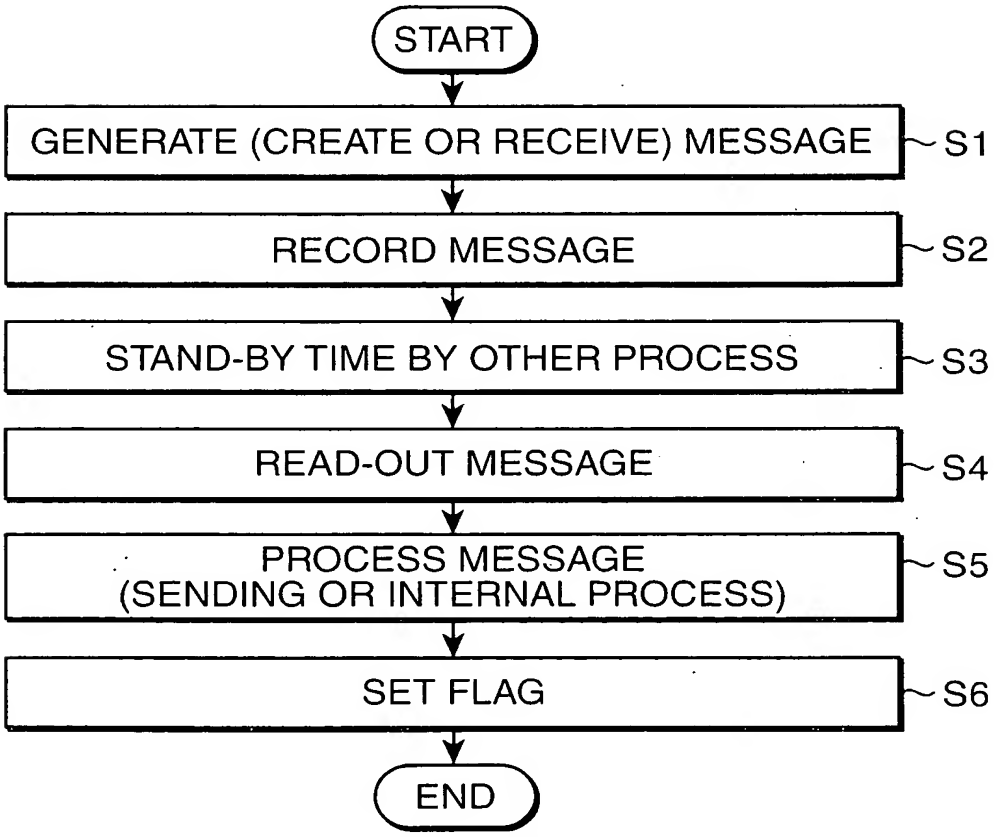

MESSAGE MEMORY
3b
6:EXTERNAL /INTERNAL NOTIFICATION
MESSAGE MEMORY
3a
FLAG SETTING
45
40
6
41
42
6:EXTERNAL NOTIFICATION /RESPONSE TO CONTROL REQUEST
MESSAGE CREATING
MESSAGE SENDING
MESSAGE RECEIVING
PROTOCOL CONVERTING
43
MESSAGE SENDING
44
L
37
46
WRITING
DETECTING
EXTERNAL/INTERNAL NOTIFICATION
6:RESPONSE TO DATA/CONTROL REQUEST
21b
MESSAGE CREATING
REGISTER
50
51
21a
DISCRIMINA -TION DATABASE MEMORY
RESTARTING
RESTART SIGNAL RECEIVING
REGISTER
48
MESSAGE DISCRIMINAT -ING
DRIVE CONTROLLING
8:RESTART SIGNAL
53
36
35
INSTRUCTING
49
4a
WRITING
34
6:CONTROL REQUEST
32
31
30
MESSAGE RECEIVING
MESSAGE SENDING
PROTOCOL CONVERTING
MESSAGE RECEIVING
6
3b
33
6:DATA REQUEST
MESSAGE MEMORY
FLAG SETTING
MESSAGE MEMORY
3a
102:CONTROLLING SECTION
101
103:COMMUNICATING SECTION

FIG. 5

MESSAGE CONTENTS
CONTROL REQUEST
DATA REQUEST
RESPONSE TO CONTROL REQUEST
RESPONSE TO DATA REQUEST
NOTIFICATION

FIG. 6



S100:ORDINARY PROCESS

FIG. 7

MESSAGE GENERATION	MESSAGE PROCESSING
CREATE MESSAGE	SEND MESSAGE
RECEIVE MESSAGE	SEND MESSAGE
RECEIVE MESSAGE	INTERNAL PROCESSING

FIG. 8

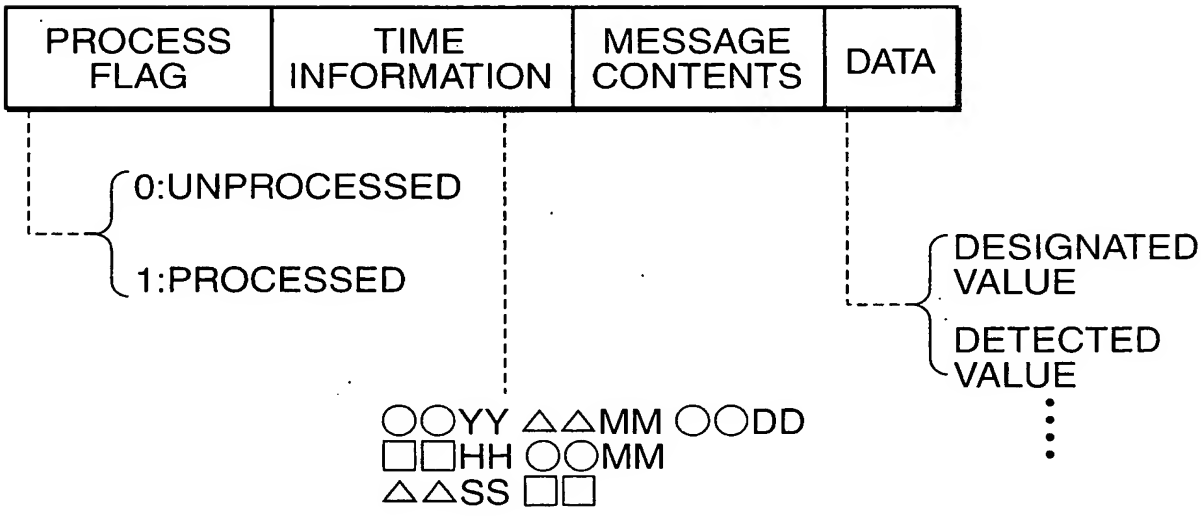


FIG. 9

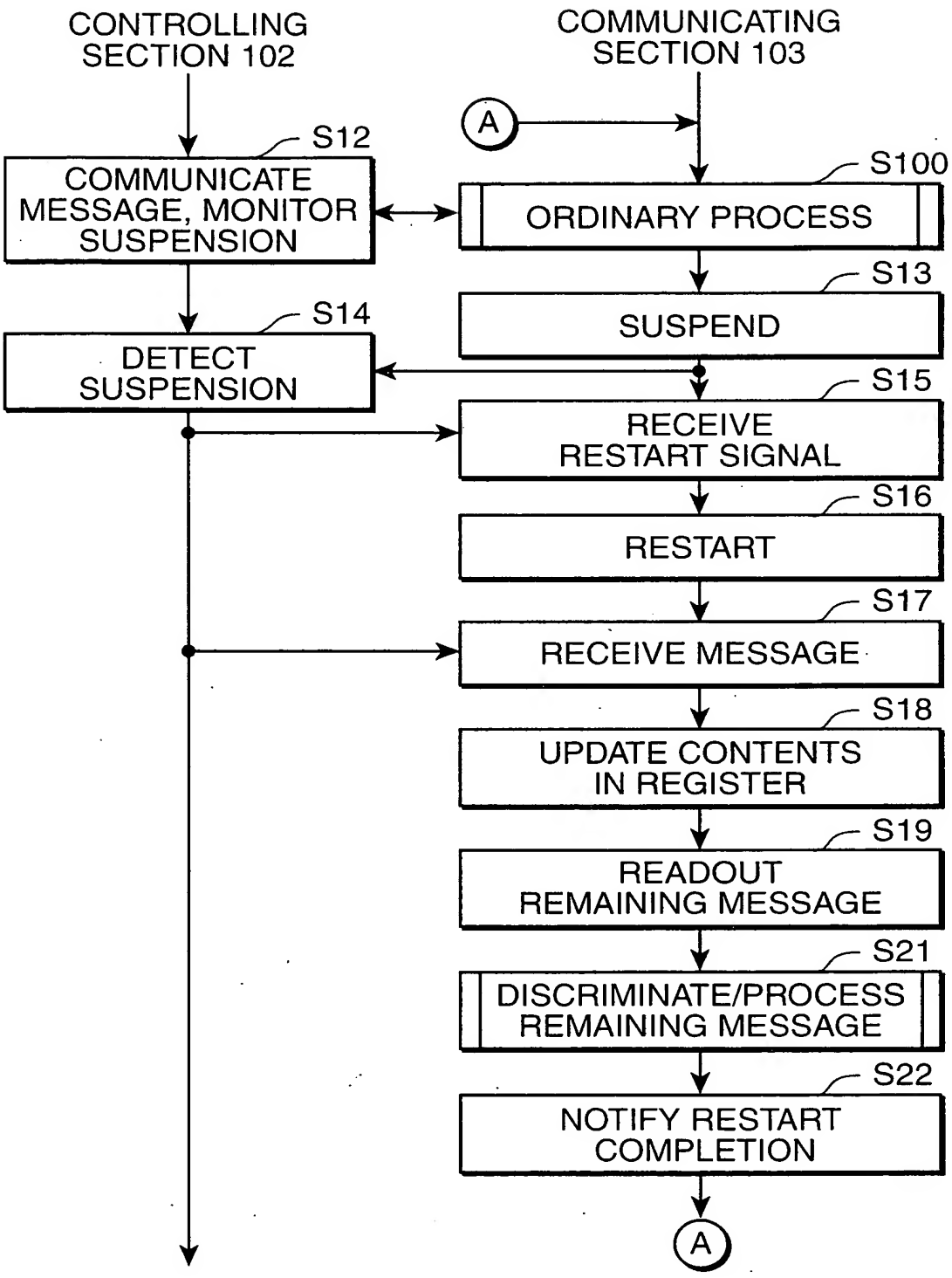

CONTROLLING SECTION 102
COMMUNICATING SECTION 103
A
S12
COMMUNICATE MESSAGE, MONITOR SUSPENSION
S100
ORDINARY PROCESS
S13
SUSPEND
S14
DETECT SUSPENSION
S15
RECEIVE RESTART SIGNAL
S16
RESTART
S17
RECEIVE MESSAGE
S18
UPDATE CONTENTS IN REGISTER
S19
READOUT REMAINING MESSAGE
S21
DISCRIMINATE/PROCESS REMAINING MESSAGE
S22
NOTIFY RESTART COMPLETION
A

FIG. 10

MESSAGE CONTENTS	EFFECTIVE TERM	NECESSITY ON RECREATION
REQUEST ON TEMPERATURE ADJUSTMENT	180 sec	×
REQUEST ON SET TEMPERATURE DATA	100 sec	×
REQUEST ON WATER QUANTITY DATA IN ICE MAKING MACHINERY	180 sec	×
NON-PERIODICAL NOTIFICATION ON DOOR OPENING/CLOSING	100 sec	○
NON-PERIODICAL NOTIFICATION ON MOTOR MALFUNCTION	UNLIMITED	×
PERIODICAL NOTIFICATION THAT COMPONENT IS OPERATED IN ORDER	100 sec	×
PERIODICAL NOTIFICATION ON CONSUMED POWER	100 sec	○
RESPONSE INDICATING ADJUSTMENT COMPLETION TO TEMPERATURE ADJUSTMENT REQUEST	180 sec	×
SEND TEMPERATURE DATA IN RESPONSE TO TEMPERATURE DATA REQUEST	100 sec	○
SEND WATER QUANTITY DATA IN RESPONSE TO WATER QUANTITY DATA REQUEST	180 sec	○
RESPONSE INDICATING THAT REQUEST IS NOT EXECUTABLE	50 sec	×

FIG. 11

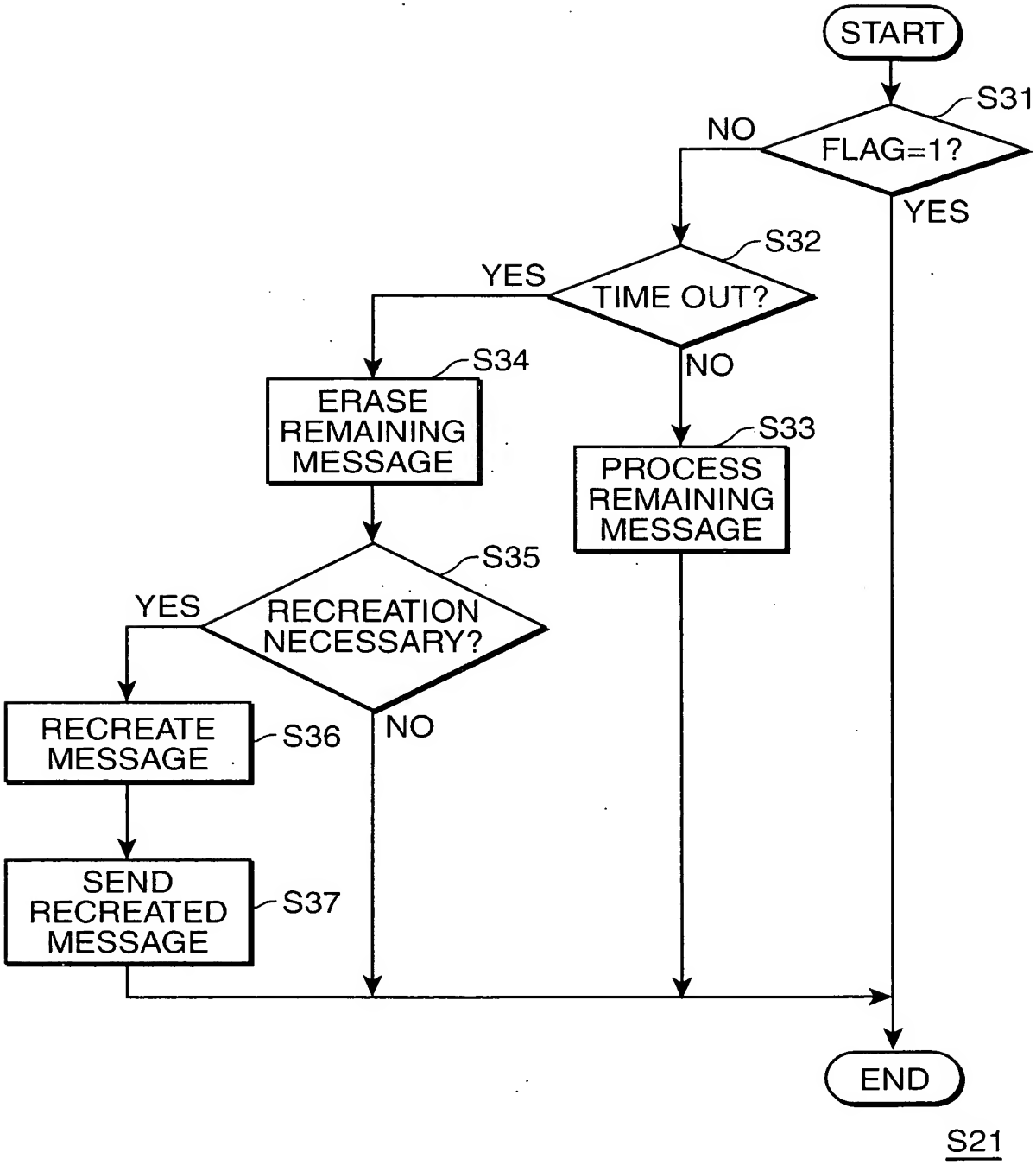

START
S31
FLAG=1?
NO
YES
S32
TIME OUT?
YES
NO
S34
ERASE REMAINING MESSAGE
S33
PROCESS REMAINING MESSAGE
S35
RECREATION NECESSARY?
YES
NO
RECREATE MESSAGE
S36
SEND RECREATED MESSAGE
S37
END
S21

FIG. 12

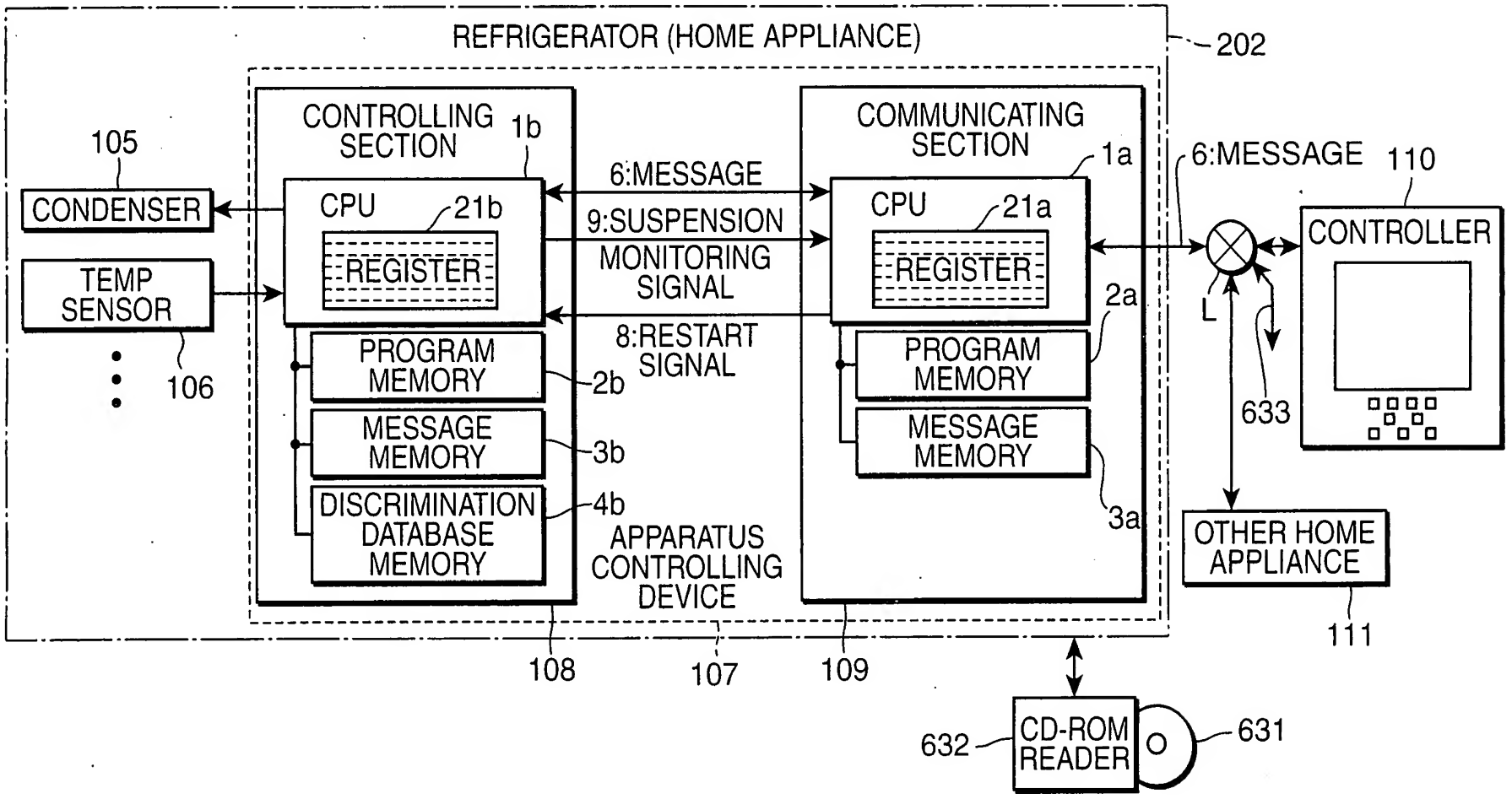

REFRIGERATOR (HOME APPLIANCE)
202
CONTROLLING SECTION
1b
COMMUNICATING SECTION
1a
105
CONDENSER
TEMP SENSOR
106
CPU
21b
REGISTER
PROGRAM MEMORY
2b
MESSAGE MEMORY
3b
DISCRIMINATION DATABASE MEMORY
4b
6:MESSAGE
9:SUSPENSION
MONITORING SIGNAL
8:RESTART SIGNAL
CPU
21a
REGISTER
2a
PROGRAM MEMORY
MESSAGE MEMORY
3a
APPARATUS CONTROLLING DEVICE
108
107
109
6:MESSAGE
110
CONTROLLER
L
633
OTHER HOME APPLIANCE
111
632
CD-ROM READER
631

FIG. 13

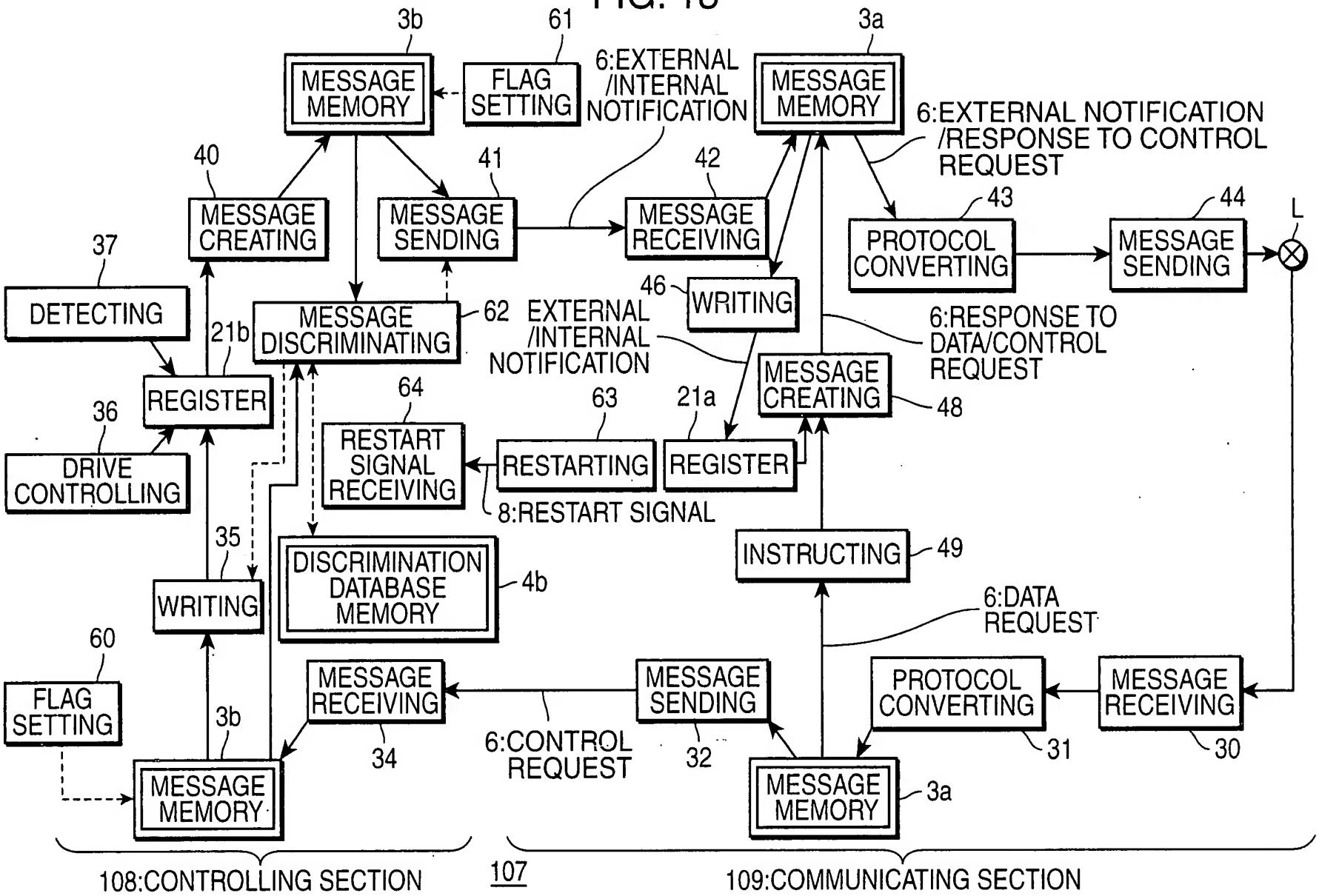

3b
61
3a
MESSAGE MEMORY
FLAG SETTING
6:EXTERNAL /INTERNAL NOTIFICATION
MESSAGE MEMORY
6:EXTERNAL NOTIFICATION /RESPONSE TO CONTROL REQUEST
40
41
42
43
44
L
MESSAGE CREATING
MESSAGE SENDING
MESSAGE RECEIVING
PROTOCOL CONVERTING
MESSAGE SENDING
37
46
DETECTING
MESSAGE DISCRIMINATING
62
EXTERNAL /INTERNAL NOTIFICATION
WRITING
6:RESPONSE TO DATA/CONTROL REQUEST
21b
REGISTER
64
63
21a
MESSAGE CREATING
48
36
RESTART SIGNAL RECEIVING
RESTARTING
REGISTER
DRIVE CONTROLLING
8:RESTART SIGNAL
35
DISCRIMINATION DATABASE MEMORY
4b
INSTRUCTING
49
6:DATA REQUEST
60
WRITING
MESSAGE RECEIVING
MESSAGE SENDING
PROTOCOL CONVERTING
MESSAGE RECEIVING
FLAG SETTING
3b
34
6:CONTROL REQUEST
32
31
30
MESSAGE MEMORY
MESSAGE MEMORY
3a
108:CONTROLLING SECTION
107
109:COMMUNICATING SECTION

FIG. 14

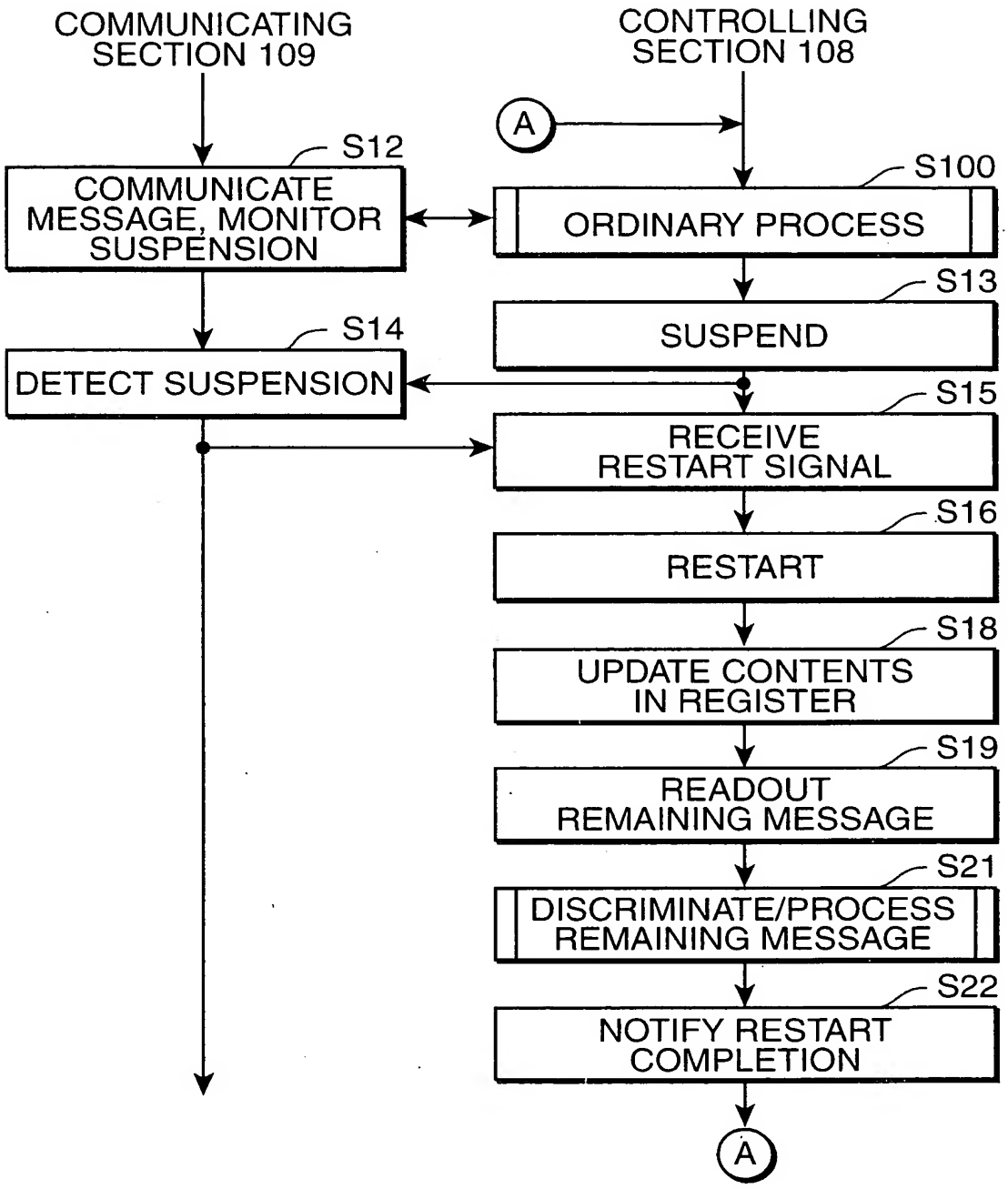

COMMUNICATING SECTION 109
CONTROLLING SECTION 108
A
S12
COMMUNICATE MESSAGE, MONITOR SUSPENSION
S100
ORDINARY PROCESS
S13
SUSPEND
S14
DETECT SUSPENSION
S15
RECEIVE RESTART SIGNAL
S16
RESTART
S18
UPDATE CONTENTS IN REGISTER
S19
READOUT REMAINING MESSAGE
S21
DISCRIMINATE/PROCESS REMAINING MESSAGE
S22
NOTIFY RESTART COMPLETION
A

FIG. 15

MESSAGE CONTENTS	EFFECTIVE TERM	NECESSITY ON RECREATION
REQUEST ON TEMPERATURE ADJUSTMENT	180 sec	×
NON-PERIODICAL INTERNAL NOTIFICATION ON SET TEMPERATURE	100 sec	○
NON-PERIODICAL INTERNAL NOTIFICATION ON WATER QUANTITY IN ICE MAKING MACHINERY	180 sec	○
NON-PERIODICAL NOTIFICATION ON DOOR OPENING/CLOSING	100 sec	○
NON-PERIODICAL NOTIFICATION ON MOTOR MALFUNCTION	UNLIMITED	×
NON-PERIODICAL NOTIFICATION THAT COMPONENT IS OPERATED IN ORDER	100 sec	×
PERIODICAL NOTIFICATION ON CONSUMED POWER	100 sec	○
RESPONSE INDICATING ADJUSTMENT COMPLETION TO TEMPERATURE ADJUSTMENT REQUEST	180 sec	×
RESPONSE INDICATING THAT REQUEST IS NOT EXECUTABLE	50 sec	×

FIG. 16

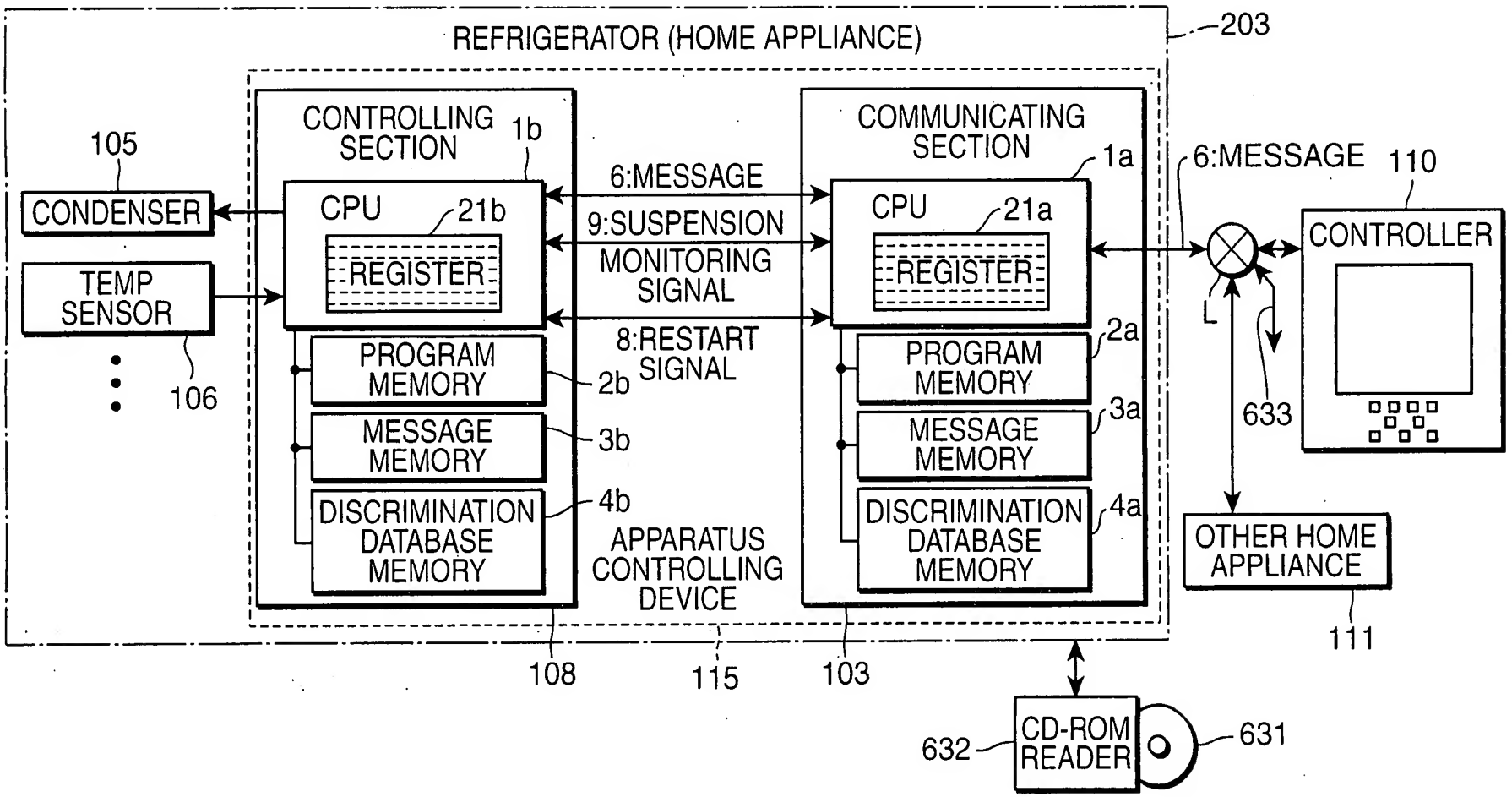

REFRIGERATOR (HOME APPLIANCE)
203
CONTROLLING SECTION
1b
COMMUNICATING SECTION
1a
105
CONDENSER
TEMP SENSOR
106
CPU
21b
REGISTER
6:MESSAGE
9:SUSPENSION
MONITORING SIGNAL
8:RESTART SIGNAL
CPU
21a
REGISTER
PROGRAM MEMORY
2b
MESSAGE MEMORY
3b
DISCRIMINATION DATABASE MEMORY
4b
PROGRAM MEMORY
2a
MESSAGE MEMORY
3a
DISCRIMINATION DATABASE MEMORY
4a
APPARATUS CONTROLLING DEVICE
108
115
103
6:MESSAGE
110
CONTROLLER
L
633
OTHER HOME APPLIANCE
111
CD-ROM READER
632
631

FIG. 17

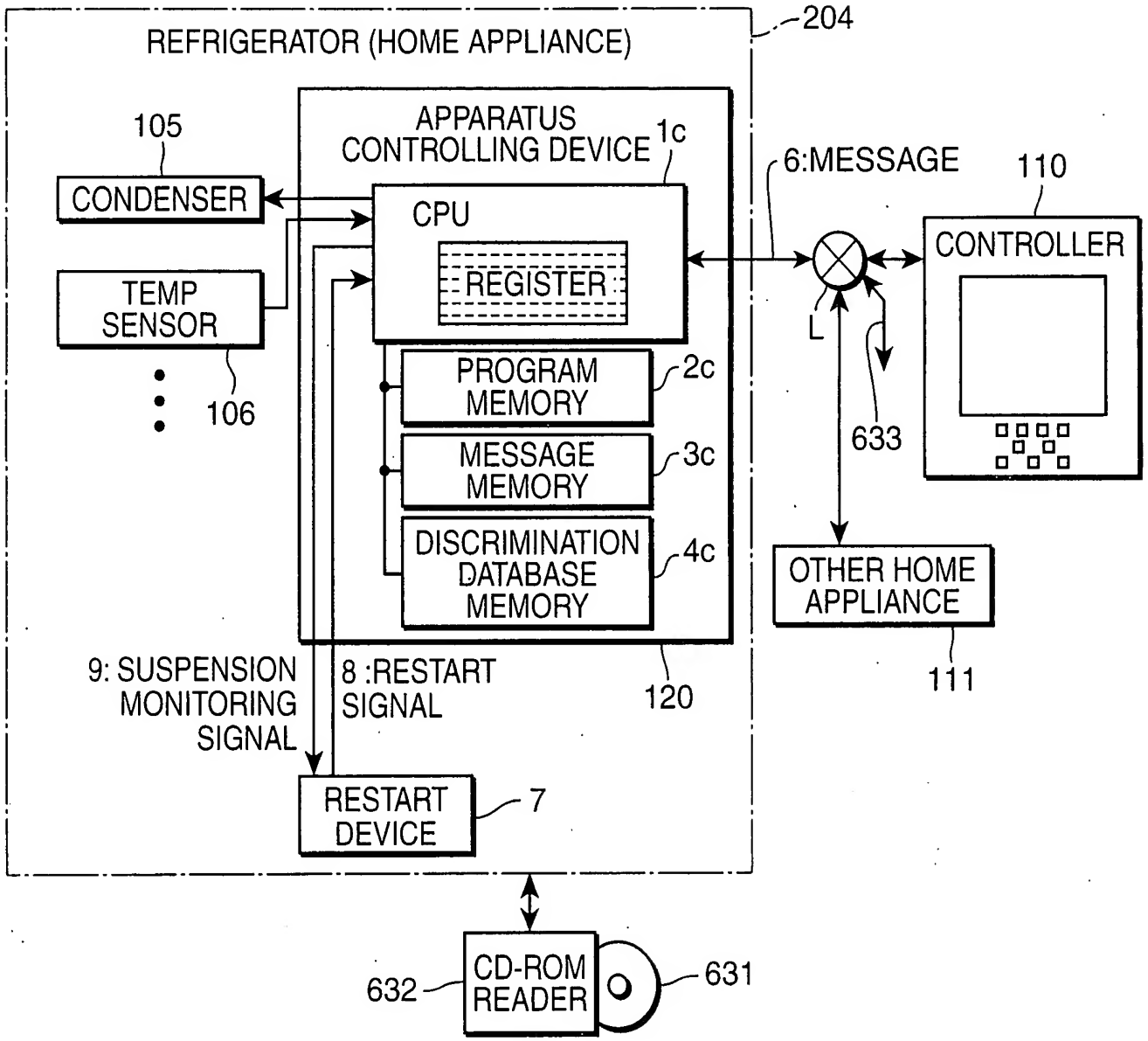

REFRIGERATOR (HOME APPLIANCE)
204
105
APPARATUS CONTROLLING DEVICE
1c
CONDENSER
CPU
REGISTER
6:MESSAGE
110
CONTROLLER
TEMP SENSOR
106
PROGRAM MEMORY
2c
MESSAGE MEMORY
3c
DISCRIMINATION DATABASE MEMORY
4c
L
633
OTHER HOME APPLIANCE
111
9: SUSPENSION MONITORING SIGNAL
8 :RESTART SIGNAL
120
RESTART DEVICE
7
632
CD-ROM READER
631

FIG. 18

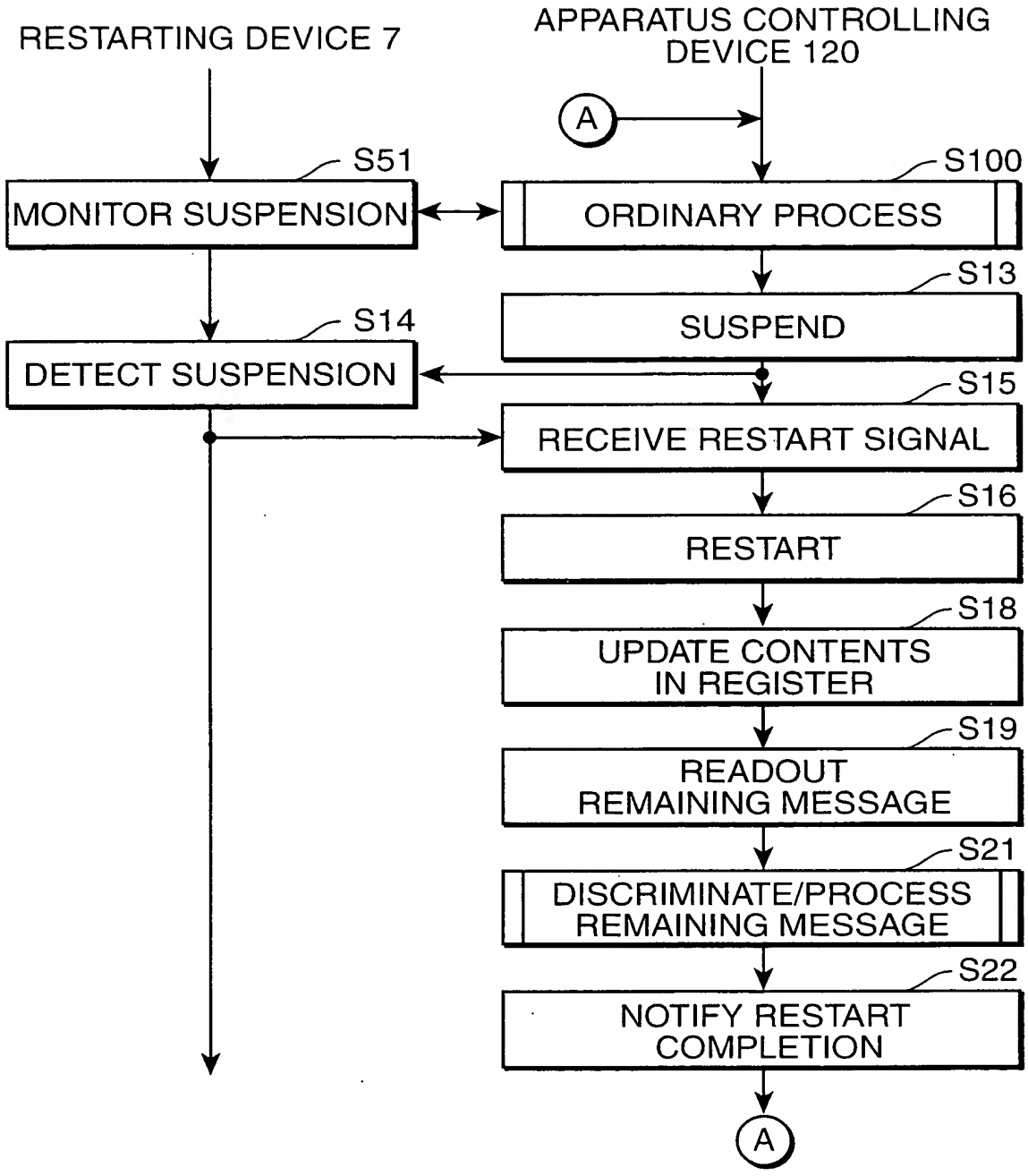

RESTARTING DEVICE 7
APPARATUS CONTROLLING DEVICE 120
A
S51
MONITOR SUSPENSION
S100
ORDINARY PROCESS
S13
SUSPEND
S14
DETECT SUSPENSION
S15
RECEIVE RESTART SIGNAL
S16
RESTART
S18
UPDATE CONTENTS IN REGISTER
S19
READOUT REMAINING MESSAGE
S21
DISCRIMINATE/PROCESS REMAINING MESSAGE
S22
NOTIFY RESTART COMPLETION
A

FIG.19

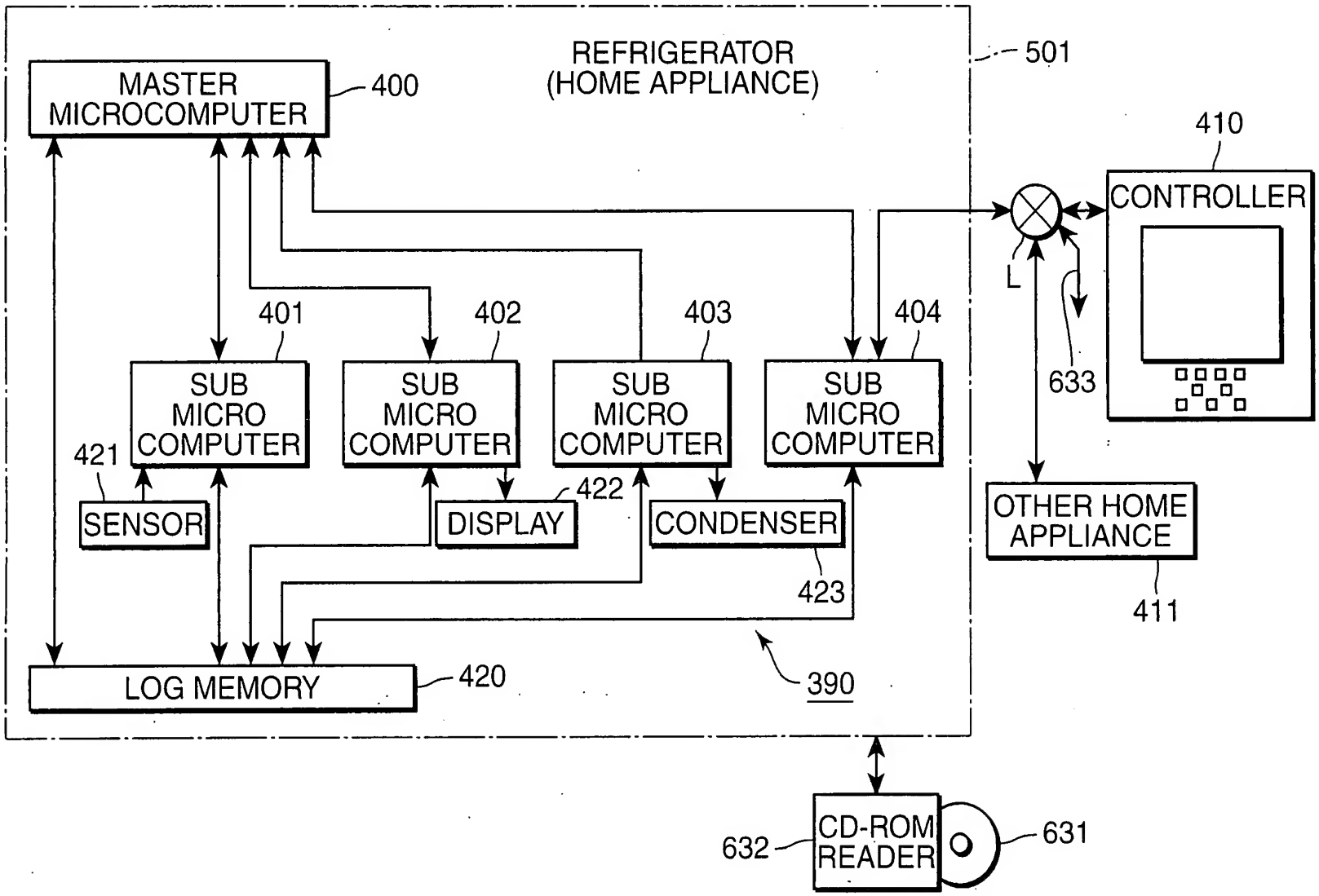

REFRIGERATOR
(HOME APPLIANCE)
501
MASTER
MICROCOMPUTER
400
410
CONTROLLER
L
633
401
402
403
404
SUB
MICRO
COMPUTER
SUB
MICRO
COMPUTER
SUB
MICRO
COMPUTER
SUB
MICRO
COMPUTER
421
SENSOR
DISPLAY
422
CONDENSER
423
OTHER HOME
APPLIANCE
411
LOG MEMORY
420
390
CD-ROM
READER
632
631

FIG.20

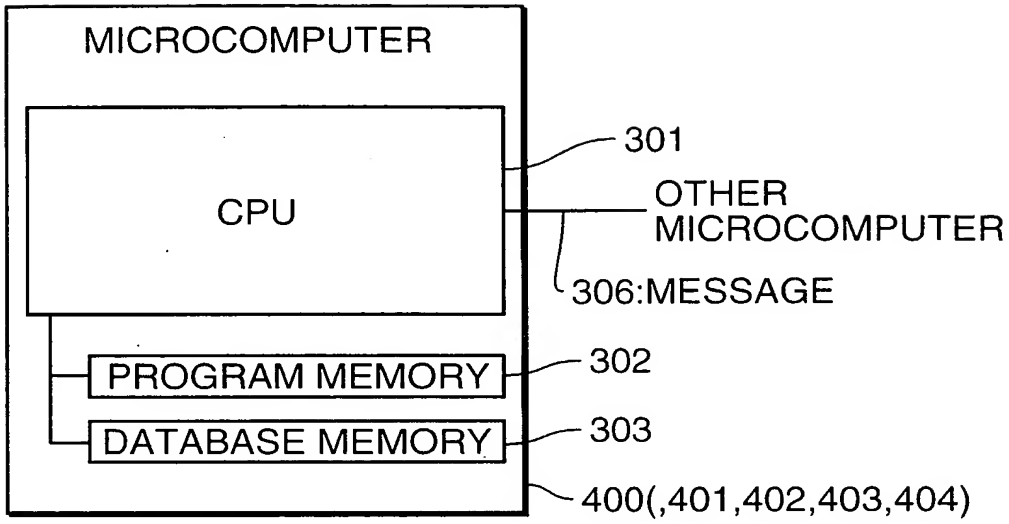

MICROCOMPUTER
CPU
PROGRAM MEMORY
DATABASE MEMORY
301
OTHER MICROCOMPUTER
306:MESSAGE
302
303
400(,401,402,403,404)

FIG.21

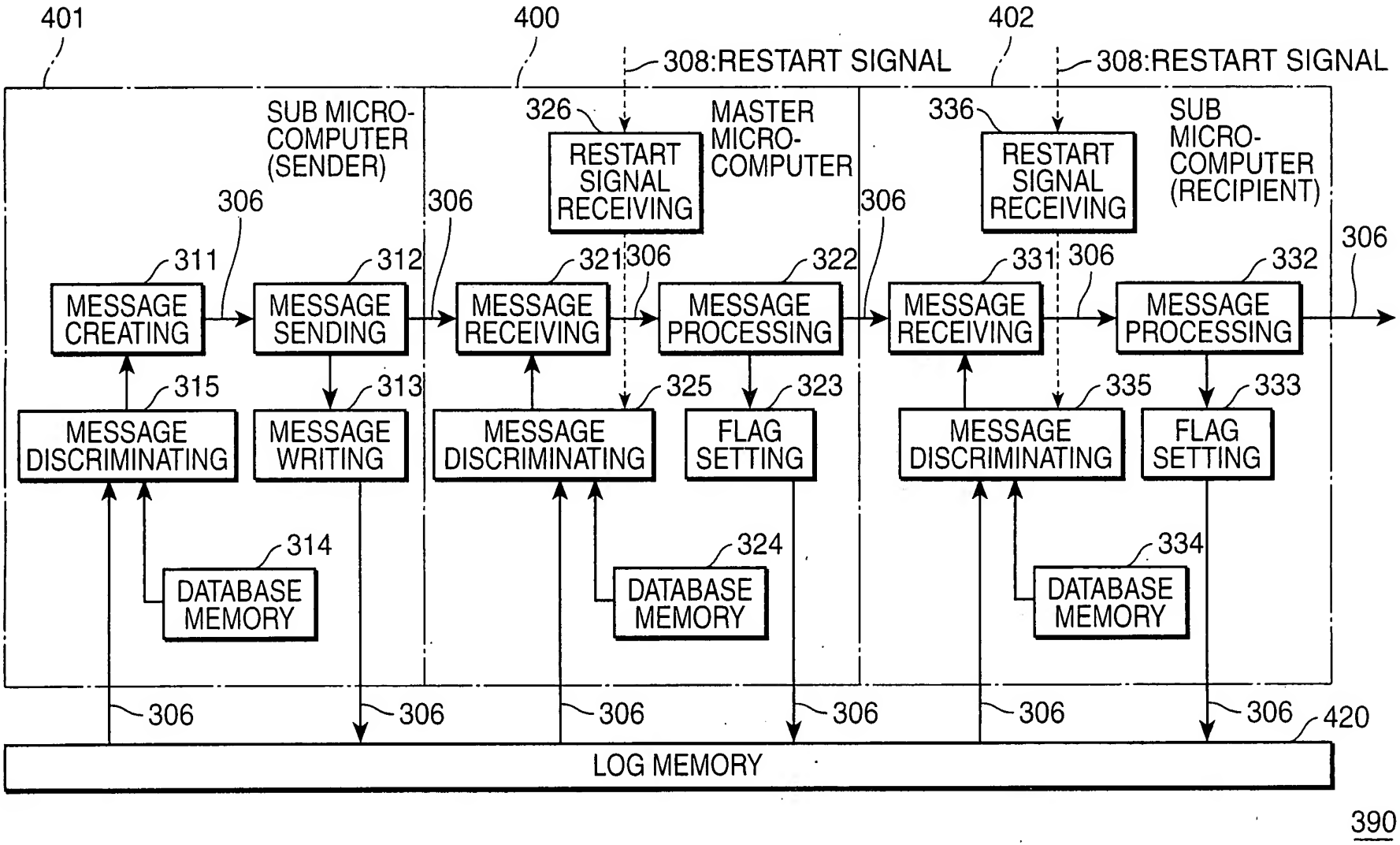

401
400
402
308:RESTART SIGNAL
308:RESTART SIGNAL
SUB MICRO-COMPUTER (SENDER)
MASTER MICRO-COMPUTER
SUB MICRO-COMPUTER (RECIPIENT)
326
336
RESTART SIGNAL RECEIVING
RESTART SIGNAL RECEIVING
306
306
306
306
306
311
312
321
322
331
332
MESSAGE CREATING
MESSAGE SENDING
MESSAGE RECEIVING
MESSAGE PROCESSING
MESSAGE RECEIVING
MESSAGE PROCESSING
315
313
325
323
335
333
MESSAGE DISCRIMINATING
MESSAGE WRITING
MESSAGE DISCRIMINATING
FLAG SETTING
MESSAGE DISCRIMINATING
FLAG SETTING
314
324
334
DATABASE MEMORY
DATABASE MEMORY
DATABASE MEMORY
306
306
306
306
306
306
420
LOG MEMORY
390

FIG.22

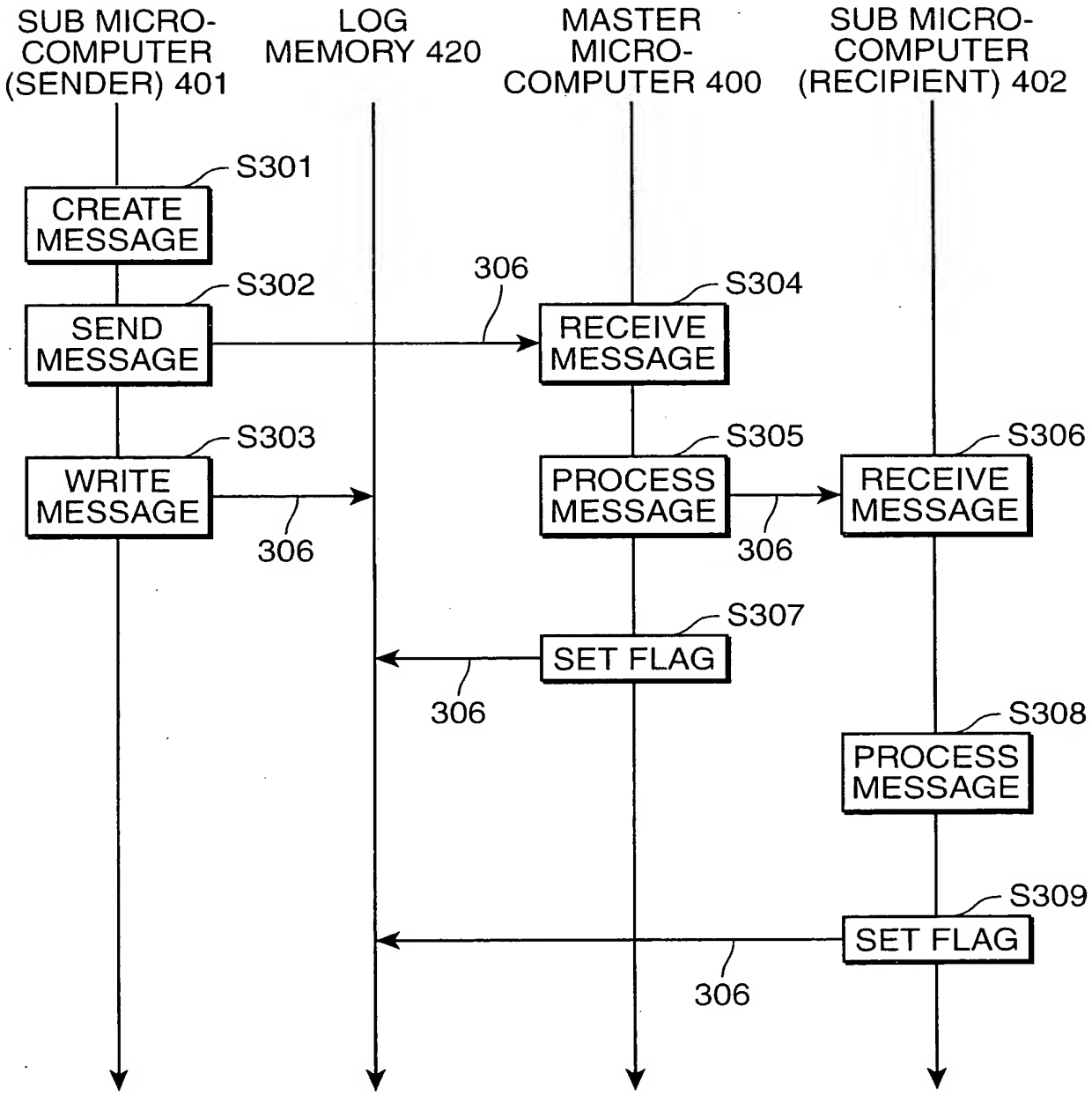

SUB MICRO-COMPUTER (SENDER) 401
LOG MEMORY 420
MASTER MICRO-COMPUTER 400
SUB MICRO-COMPUTER (RECIPIENT) 402
S301
CREATE MESSAGE
S302
SEND MESSAGE
306
S304
RECEIVE MESSAGE
S303
WRITE MESSAGE
306
S305
PROCESS MESSAGE
306
S306
RECEIVE MESSAGE
S307
SET FLAG
306
S308
PROCESS MESSAGE
S309
SET FLAG
306

FIG.23

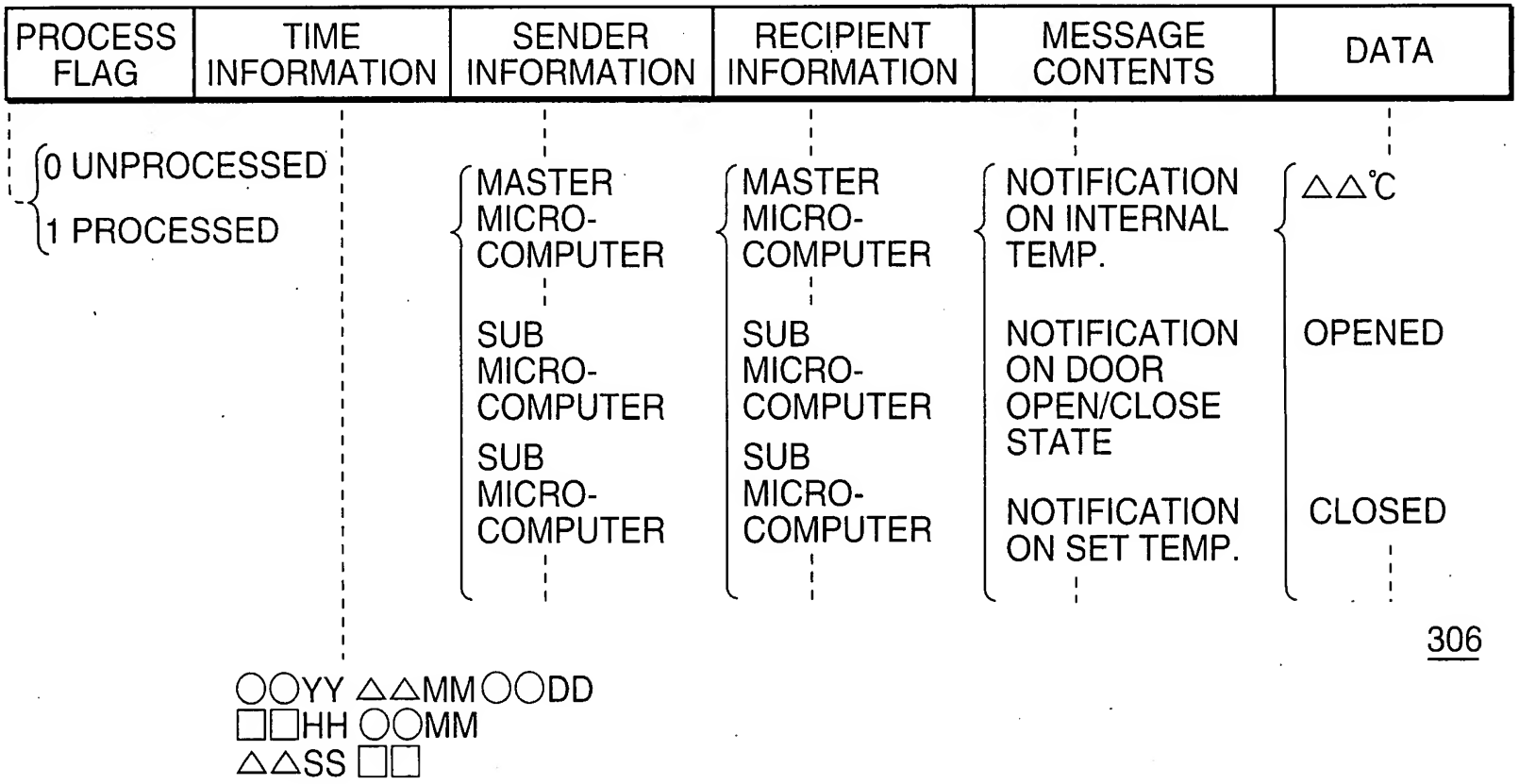

PROCESS FLAG
TIME INFORMATION
SENDER INFORMATION
RECIPIENT INFORMATION
MESSAGE CONTENTS
DATA
0 UNPROCESSED
1 PROCESSED
MASTER MICRO-COMPUTER
SUB MICRO-COMPUTER
SUB MICRO-COMPUTER
MASTER MICRO-COMPUTER
SUB MICRO-COMPUTER
SUB MICRO-COMPUTER
NOTIFICATION ON INTERNAL TEMP.
NOTIFICATION ON DOOR OPEN/CLOSE STATE
NOTIFICATION ON SET TEMP.
△△℃
OPENED
CLOSED
306
○○YY △△MM○○DD
□□HH ○○MM
△△SS □□

FIG.24

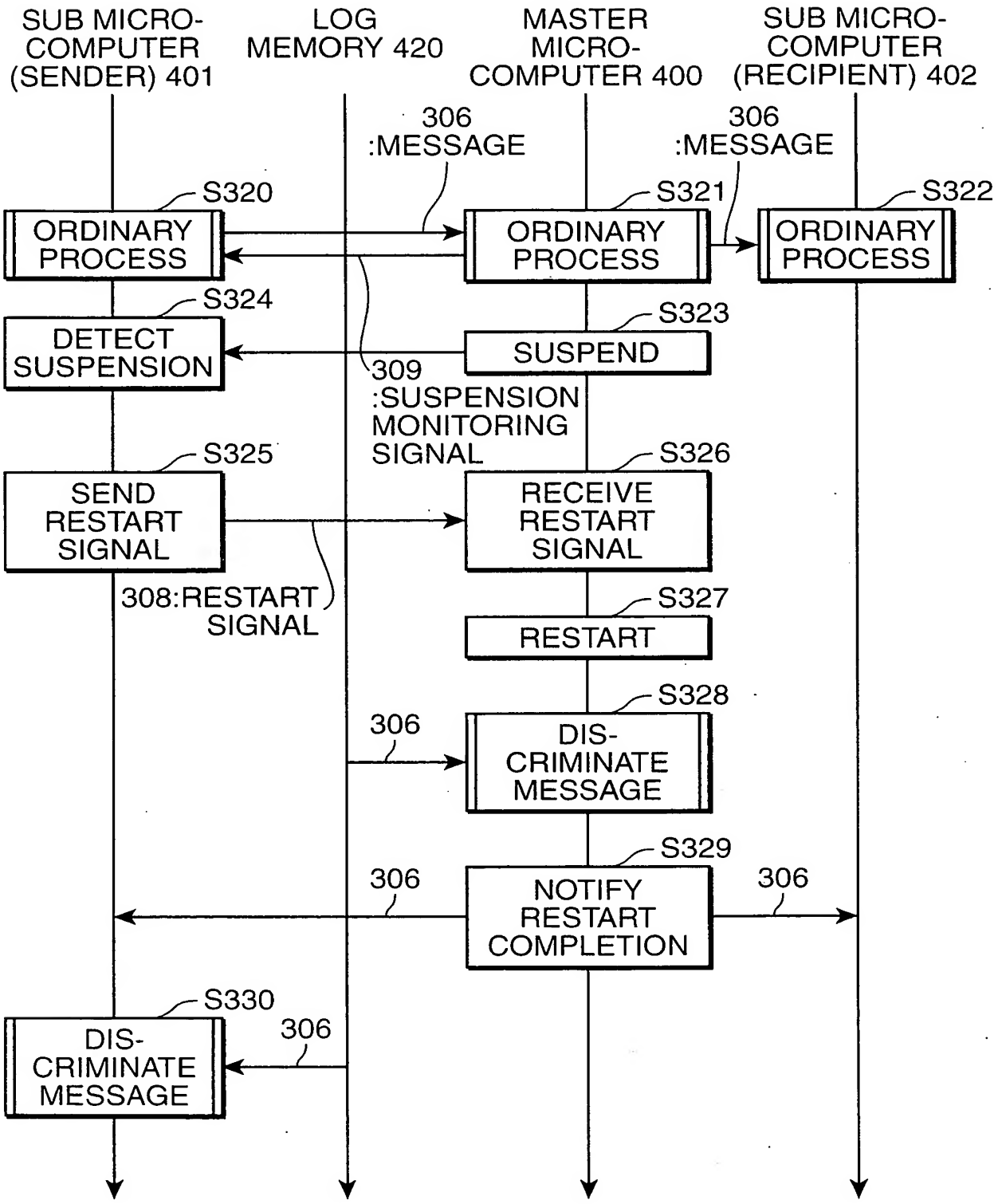

SUB MICRO-COMPUTER (SENDER) 401
LOG MEMORY 420
MASTER MICRO-COMPUTER 400
SUB MICRO-COMPUTER (RECIPIENT) 402
306 :MESSAGE
306 :MESSAGE
S320
S321
S322
ORDINARY PROCESS
ORDINARY PROCESS
ORDINARY PROCESS
S324
S323
DETECT SUSPENSION
SUSPEND
309 :SUSPENSION MONITORING SIGNAL
S325
S326
SEND RESTART SIGNAL
RECEIVE RESTART SIGNAL
308:RESTART SIGNAL
S327
RESTART
S328
306
DIS-CRIMINATE MESSAGE
S329
306
306
NOTIFY RESTART COMPLETION
S330
306
DIS-CRIMINATE MESSAGE

FIG.25

MESSAGE CONTENTS	EFFECTIVE TERM
NOTIFICATION ON INTERNAL TEMP.	180sec
NOTIFICATION ON DOOR OPEN/CLOSE STATE	100sec
NOTIFICATION ON MOTOR MALFUNCTION	UNLIMITED

FIG.26

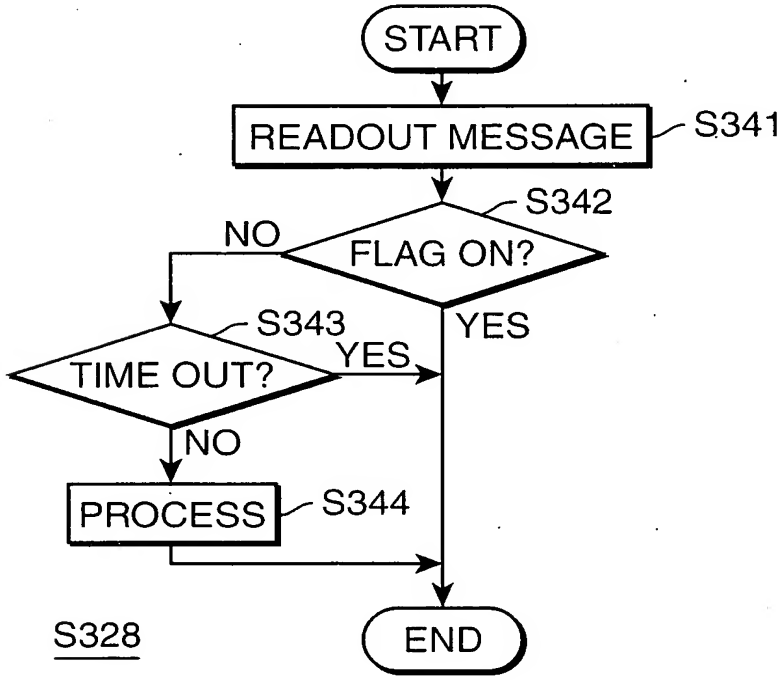


FIG.27

MESSAGE CONTENTS	JUDGMENT CONTENTS	NECESSITY ON RECREATION
NOTIFICATION ON INTERNAL TEMPERATURE	ALL TEMPERATURE RANGE	○

FIG.28

MESSAGE CONTENTS	JUDGMENT CONTENTS	NECESSITY ON RECREATION
NOTIFICATION ON OPEN/CLOSE STATE OF DOOR	DIFFERENT	○
NOTIFICATION ON OPEN/CLOSE STATE OF DOOR	SAME	×

FIG.29

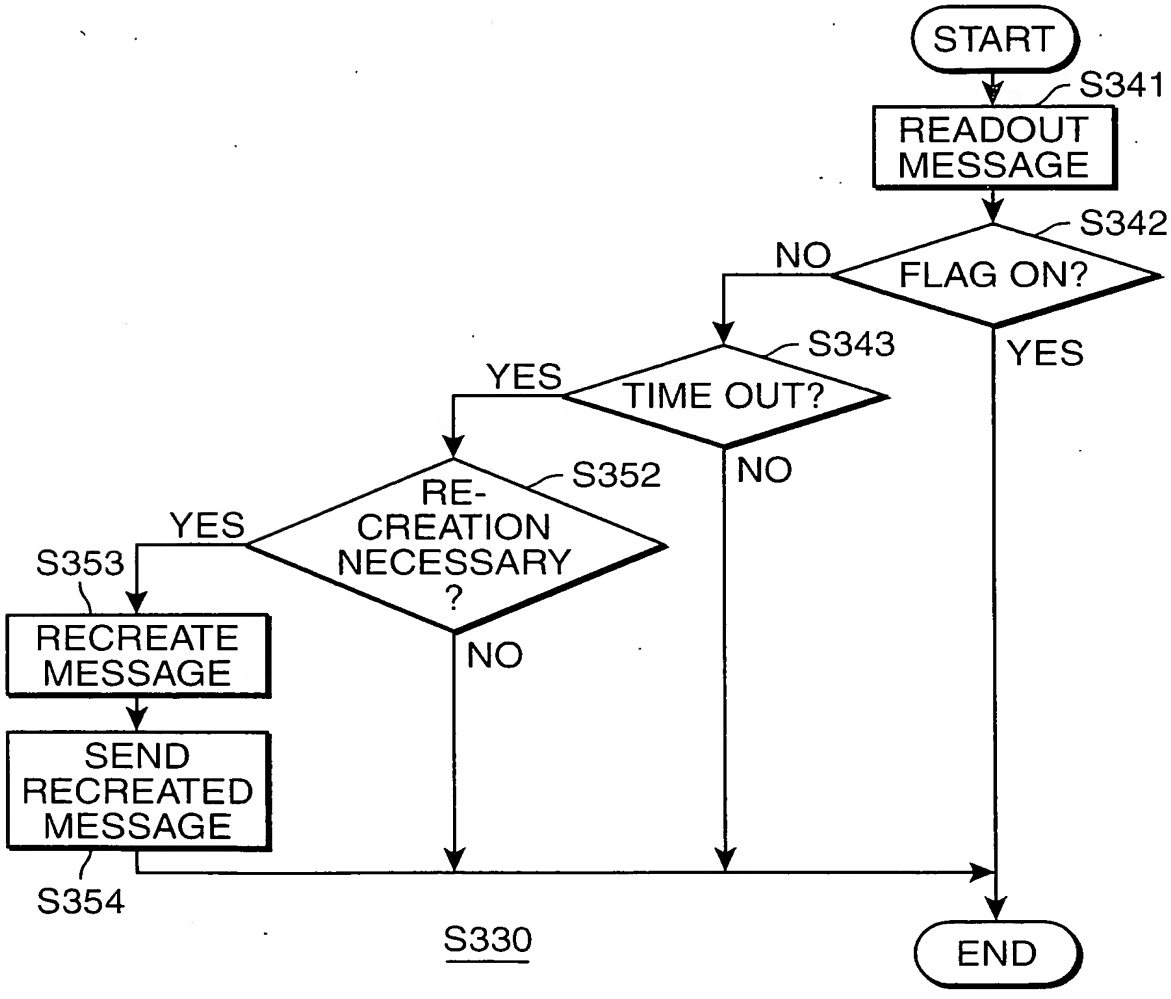


FIG.30

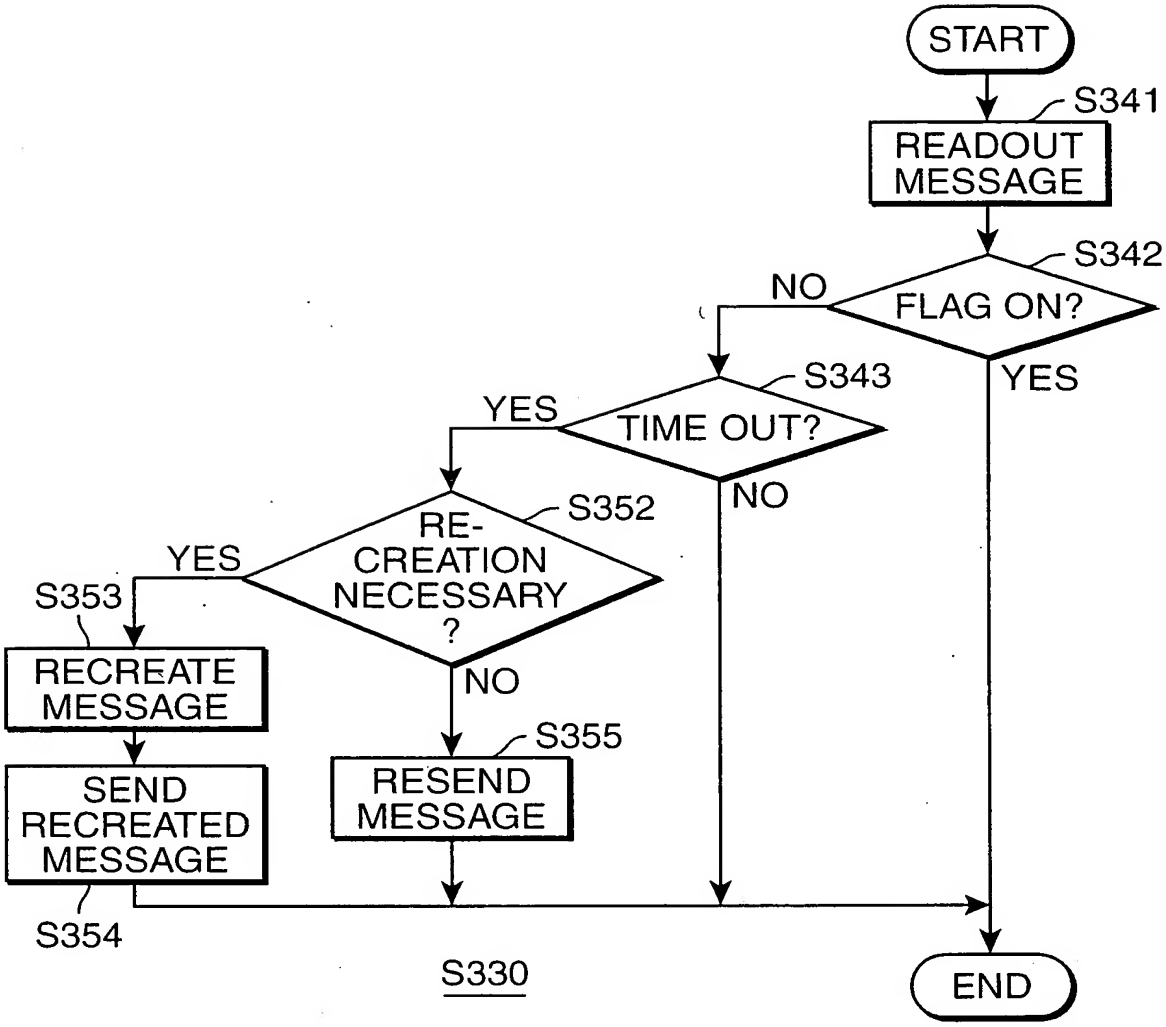

START
S341
READOUT MESSAGE
S342
FLAG ON?
NO
YES
S343
TIME OUT?
YES
NO
S352
RE-CREATION NECESSARY ?
YES
NO
S353
RECREATE MESSAGE
SEND RECREATED MESSAGE
S354
S355
RESEND MESSAGE
END
S330

FIG.31

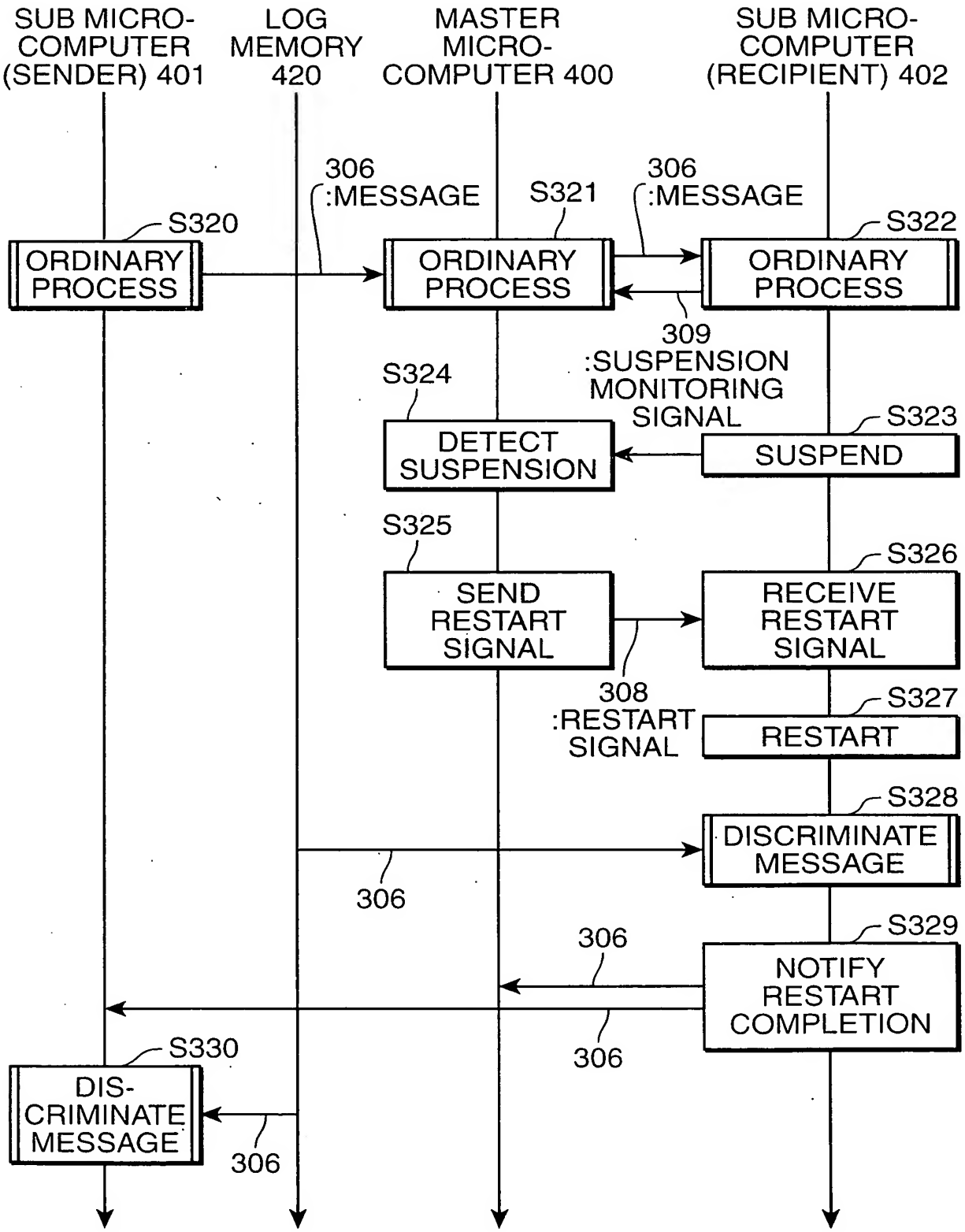

SUB MICRO-COMPUTER (SENDER) 401
LOG MEMORY 420
MASTER MICRO-COMPUTER 400
SUB MICRO-COMPUTER (RECIPIENT) 402
306 :MESSAGE
S321
306 :MESSAGE
S320
S322
ORDINARY PROCESS
ORDINARY PROCESS
ORDINARY PROCESS
309 :SUSPENSION MONITORING SIGNAL
S324
S323
DETECT SUSPENSION
SUSPEND
S325
S326
SEND RESTART SIGNAL
RECEIVE RESTART SIGNAL
308 :RESTART SIGNAL
S327
RESTART
S328
DISCRIMINATE MESSAGE
306
306
S329
NOTIFY RESTART COMPLETION
306
S330
DIS-CRIMINATE MESSAGE
306

FIG.32

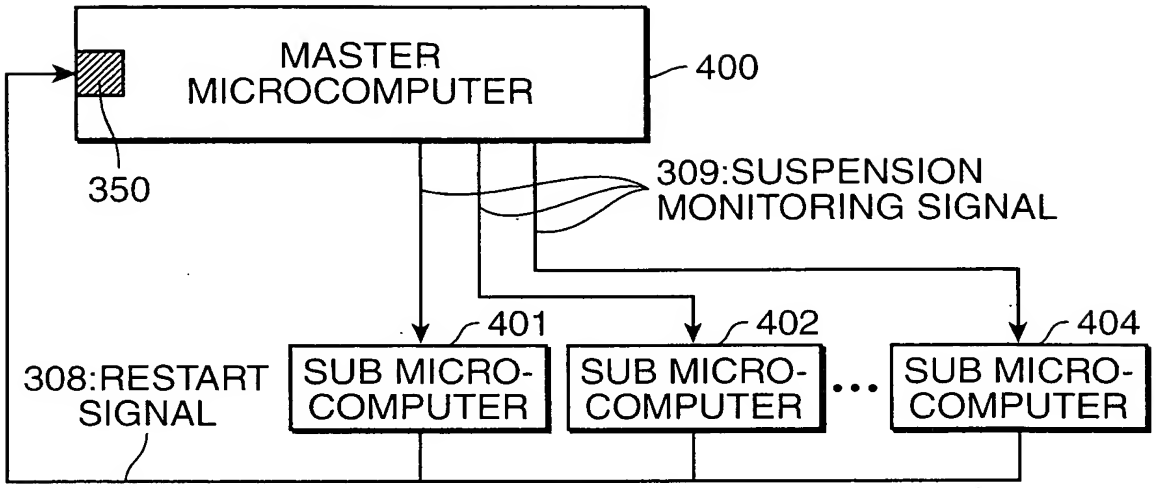

MASTER
MICROCOMPUTER
400
350
309:SUSPENSION
MONITORING SIGNAL
401
402
404
308:RESTART
SIGNAL
SUB MICRO-
COMPUTER
SUB MICRO-
COMPUTER
SUB MICRO-
COMPUTER

FIG.33

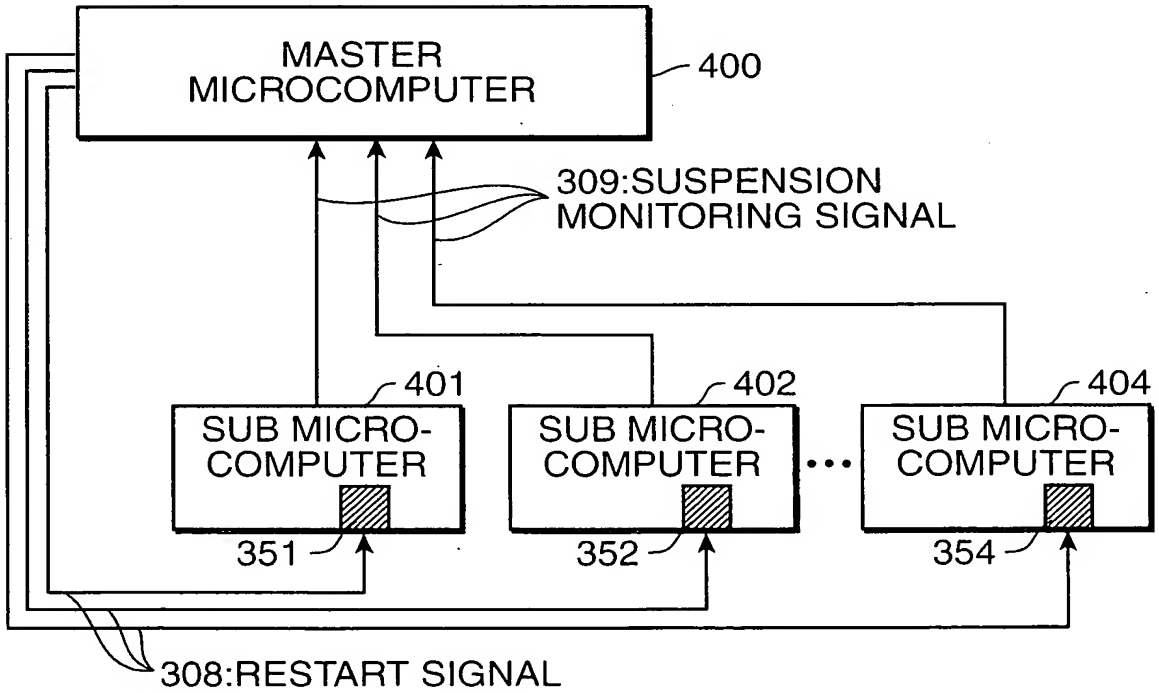

MASTER
MICROCOMPUTER
400
309:SUSPENSION
MONITORING SIGNAL
401
402
404
SUB MICRO-
COMPUTER
SUB MICRO-
COMPUTER
SUB MICRO-
COMPUTER
351
352
354
308:RESTART SIGNAL

FIG.34

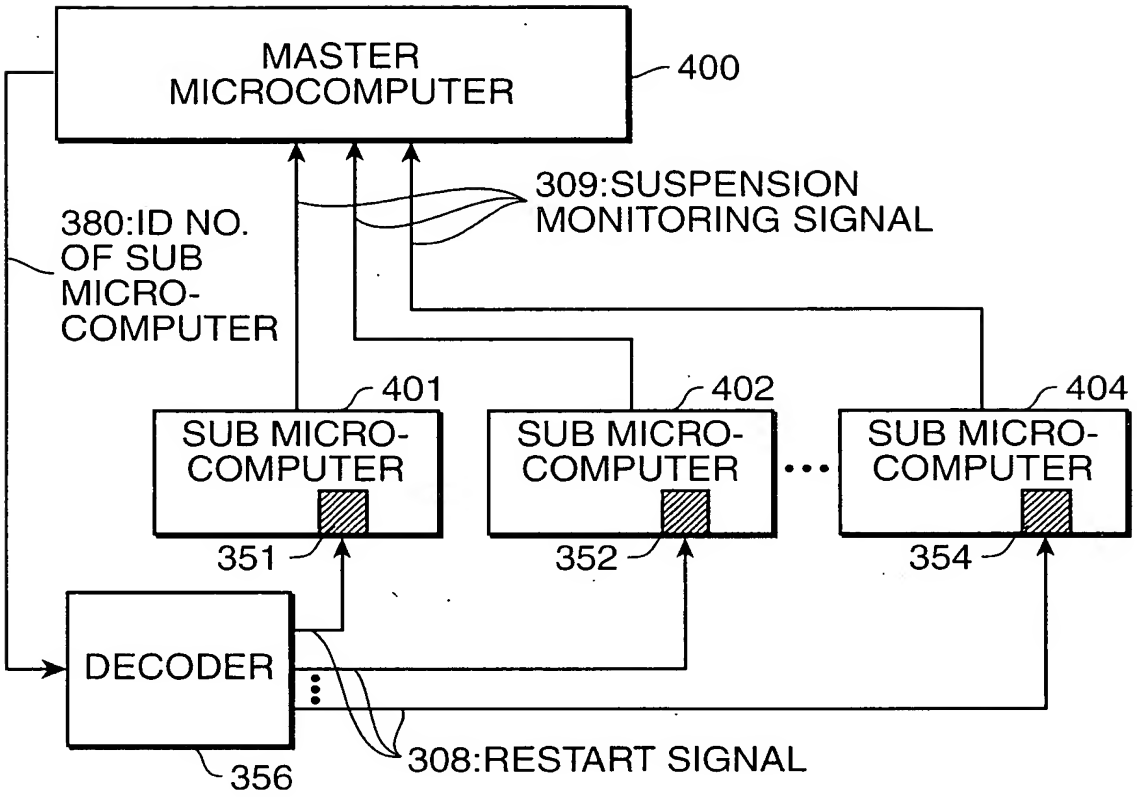

MASTER MICROCOMPUTER
400
309:SUSPENSION MONITORING SIGNAL
380:ID NO. OF SUB MICRO-COMPUTER
401
402
404
SUB MICRO-COMPUTER
SUB MICRO-COMPUTER
SUB MICRO-COMPUTER
351
352
354
DECODER
356
308:RESTART SIGNAL

FIG.35

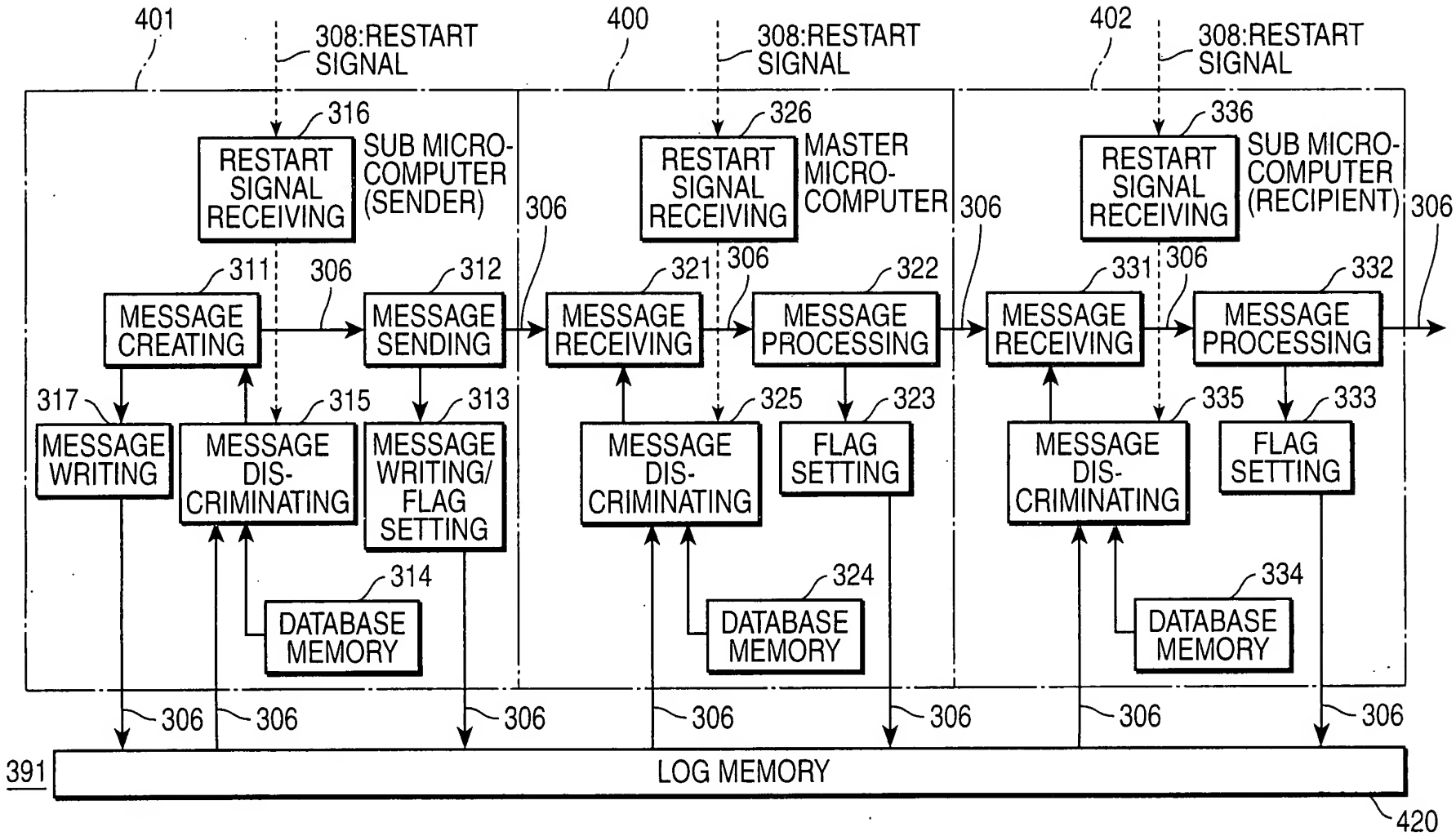

401
308:RESTART SIGNAL
400
308:RESTART SIGNAL
402
308:RESTART SIGNAL
316
RESTART SIGNAL RECEIVING
SUB MICRO-COMPUTER (SENDER)
326
RESTART SIGNAL RECEIVING
MASTER MICRO-COMPUTER
336
RESTART SIGNAL RECEIVING
SUB MICRO-COMPUTER (RECIPIENT)
306
311
MESSAGE CREATING
306
312
MESSAGE SENDING
321
MESSAGE RECEIVING
306
322
MESSAGE PROCESSING
331
MESSAGE RECEIVING
306
332
MESSAGE PROCESSING
317
MESSAGE WRITING
315
MESSAGE DIS-CRIMINATING
313
MESSAGE WRITING/ FLAG SETTING
325
MESSAGE DIS-CRIMINATING
323
FLAG SETTING
335
MESSAGE DIS-CRIMINATING
333
FLAG SETTING
314
DATABASE MEMORY
324
DATABASE MEMORY
334
DATABASE MEMORY
306
306
306
306
306
306
306
306
391
LOG MEMORY
420

FIG.36

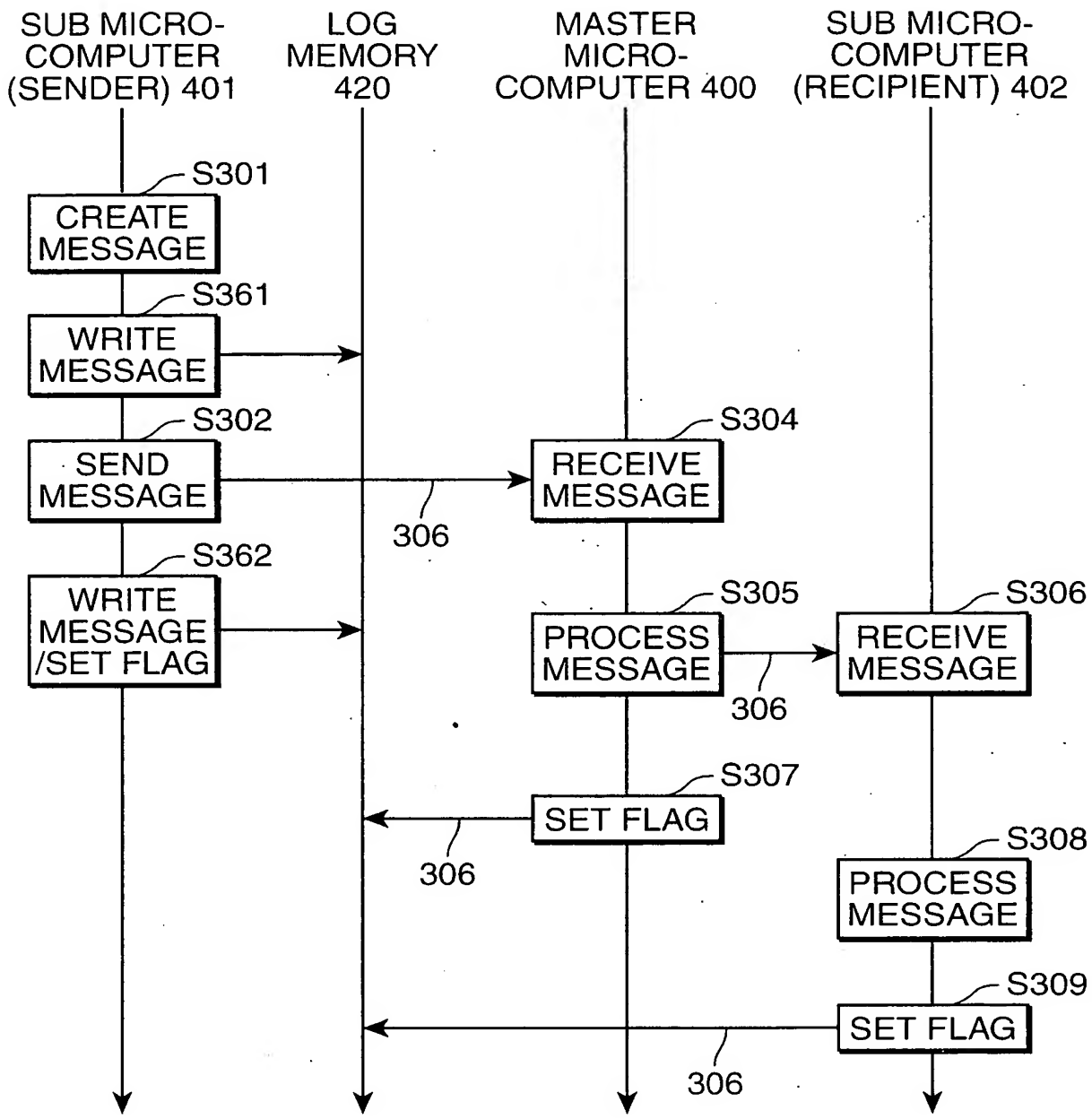

SUB MICRO-COMPUTER (SENDER) 401
LOG MEMORY 420
MASTER MICRO-COMPUTER 400
SUB MICRO-COMPUTER (RECIPIENT) 402
S301
CREATE MESSAGE
S361
WRITE MESSAGE
S302
SEND MESSAGE
306
S304
RECEIVE MESSAGE
S362
WRITE MESSAGE /SET FLAG
S305
PROCESS MESSAGE
306
S306
RECEIVE MESSAGE
S307
SET FLAG
306
S308
PROCESS MESSAGE
S309
SET FLAG
306

FIG.37

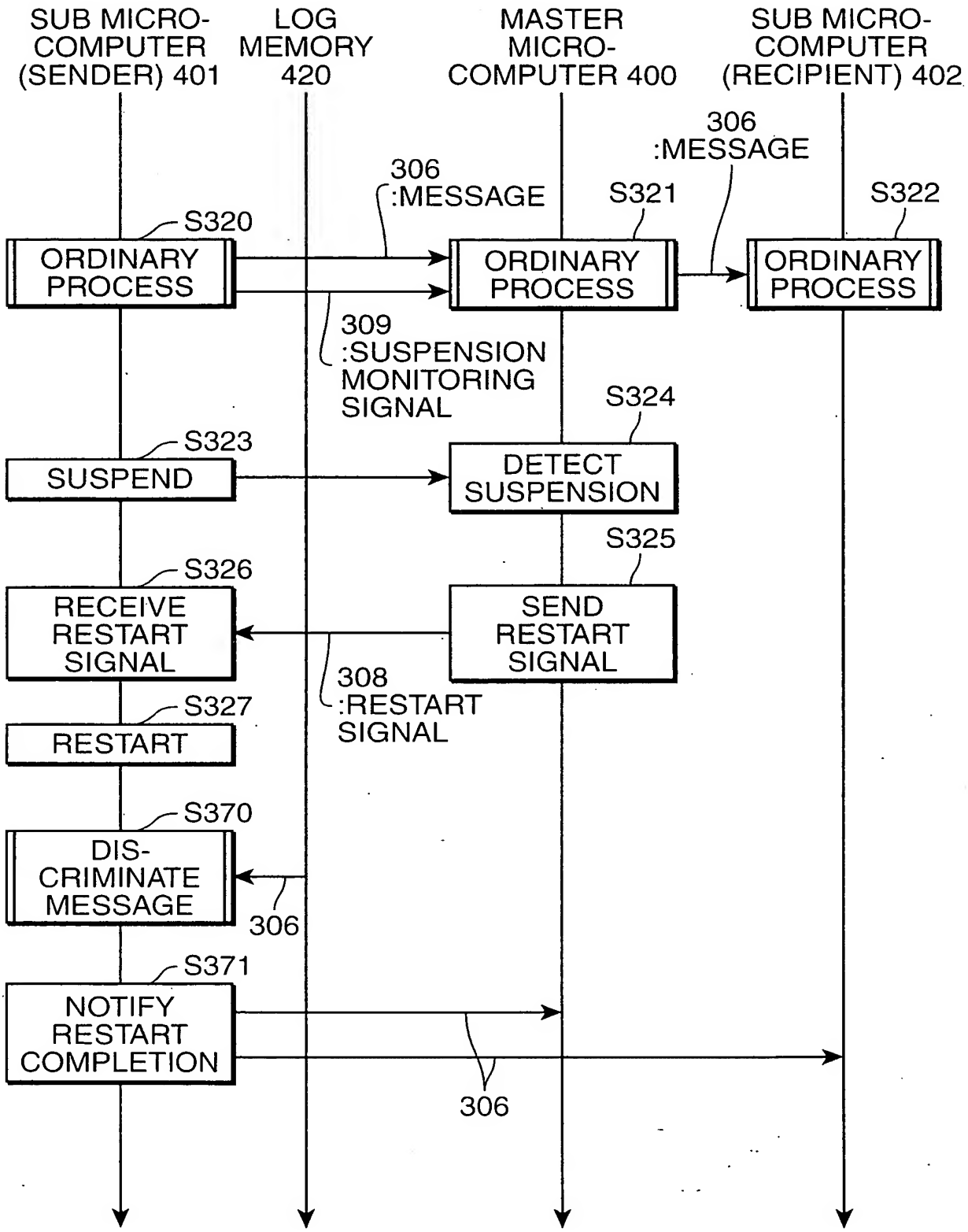
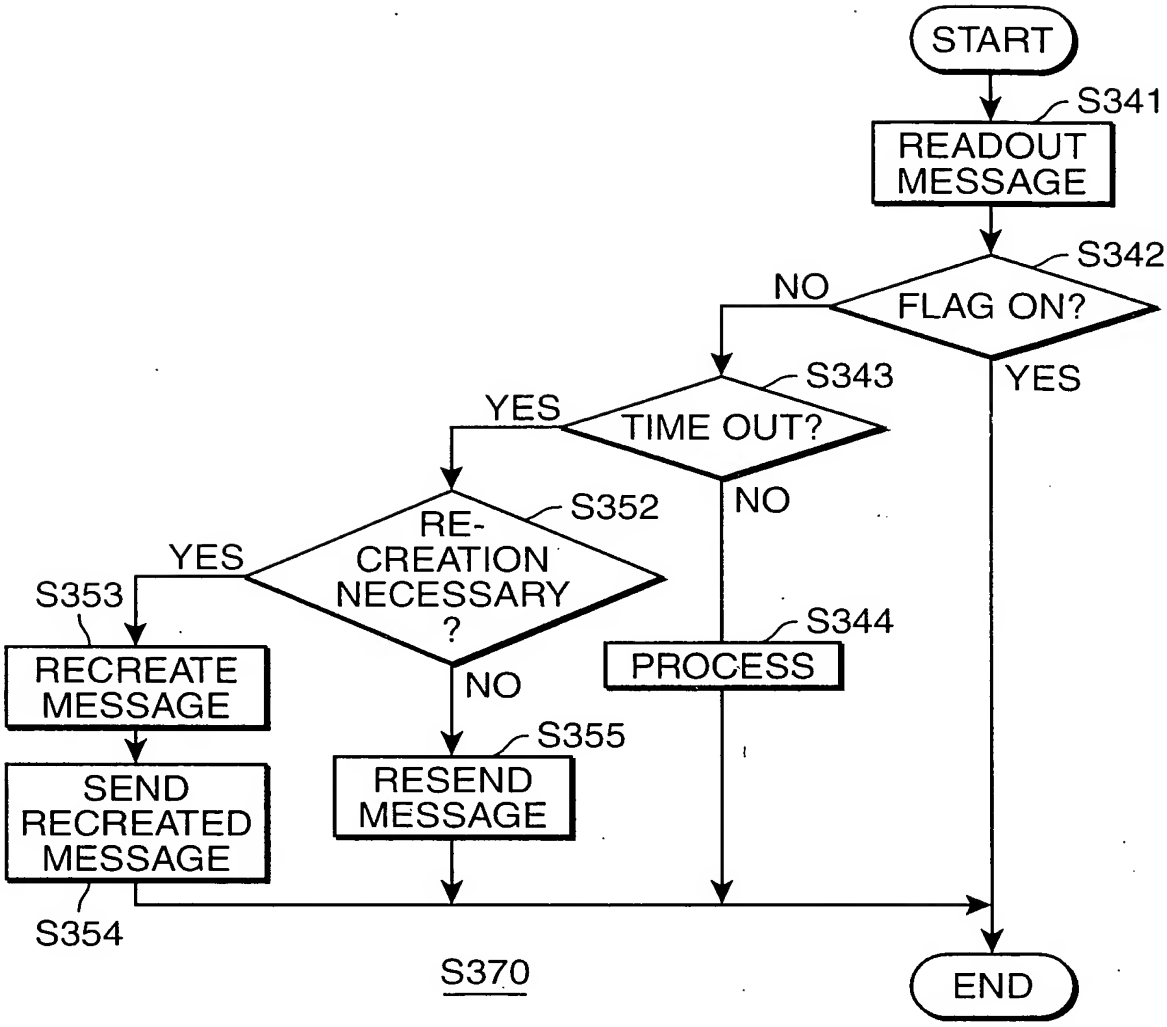

SUB MICRO-COMPUTER (SENDER) 401
LOG MEMORY 420
MASTER MICRO-COMPUTER 400
SUB MICRO-COMPUTER (RECIPIENT) 402
306 :MESSAGE
306 :MESSAGE
S320
S321
S322
ORDINARY PROCESS
ORDINARY PROCESS
ORDINARY PROCESS
309 :SUSPENSION MONITORING SIGNAL
S324
S323
SUSPEND
DETECT SUSPENSION
S325
S326
RECEIVE RESTART SIGNAL
SEND RESTART SIGNAL
308 :RESTART SIGNAL
S327
RESTART
S370
DIS-CRIMINATE MESSAGE
306
S371
NOTIFY RESTART COMPLETION
306

FIG.38


START
S341
READOUT MESSAGE
S342
FLAG ON?
NO
YES
S343
TIME OUT?
YES
NO
S352
RE-CREATION NECESSARY ?
YES
NO
S353
RECREATE MESSAGE
SEND RECREATED MESSAGE
S354
S344
PROCESS
S355
RESEND MESSAGE
END

S370

FIG.39

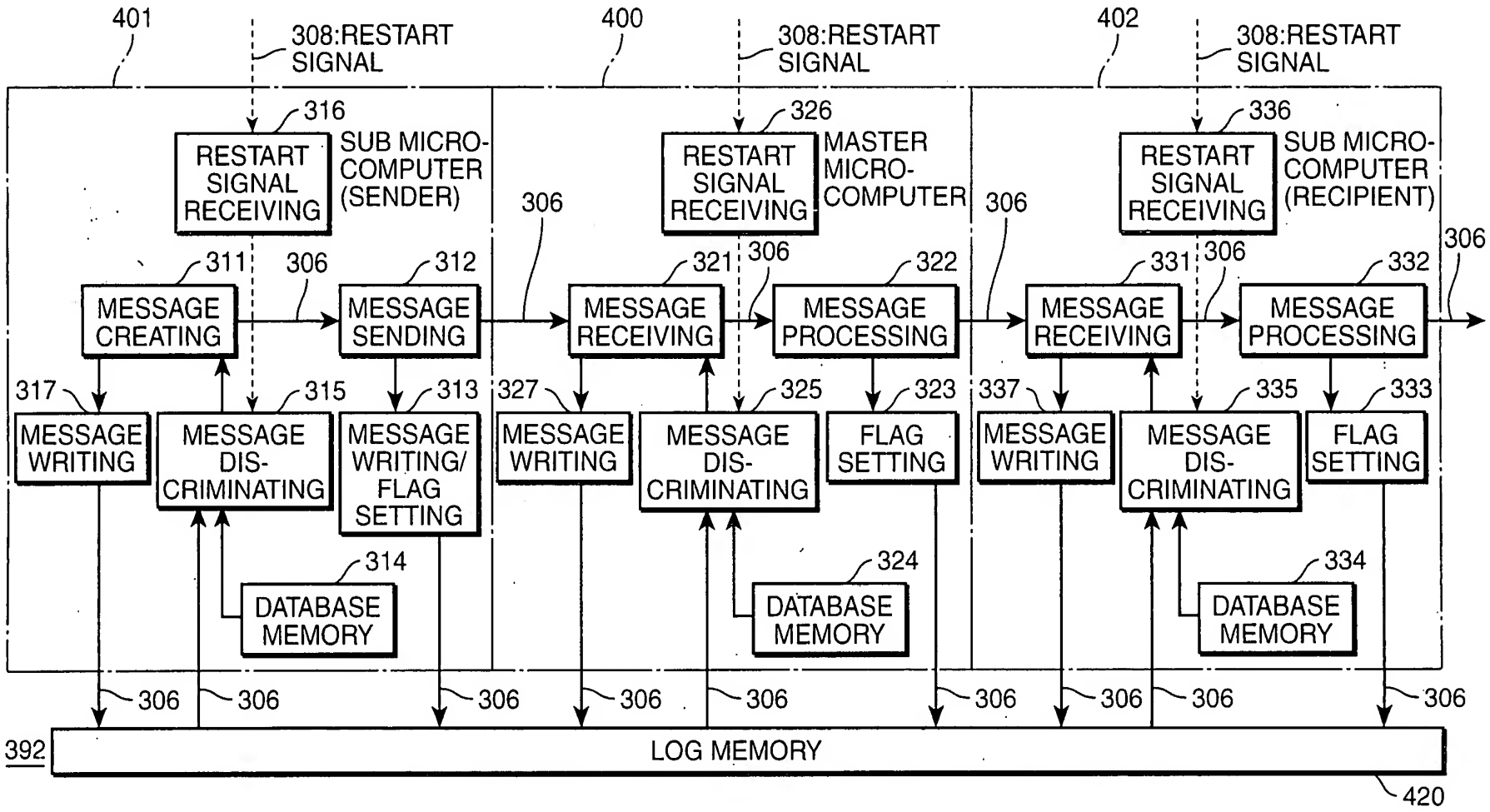

401
308:RESTART SIGNAL
400
308:RESTART SIGNAL
402
308:RESTART SIGNAL
316
RESTART SIGNAL RECEIVING
SUB MICRO-COMPUTER (SENDER)
326
RESTART SIGNAL RECEIVING
MASTER MICRO-COMPUTER
336
RESTART SIGNAL RECEIVING
SUB MICRO-COMPUTER (RECIPIENT)
306
311
MESSAGE CREATING
306
312
MESSAGE SENDING
306
321
MESSAGE RECEIVING
306
322
MESSAGE PROCESSING
306
331
MESSAGE RECEIVING
306
332
MESSAGE PROCESSING
306
317
MESSAGE WRITING
315
MESSAGE DIS-CRIMINATING
313
MESSAGE WRITING/ FLAG SETTING
327
MESSAGE WRITING
325
MESSAGE DIS-CRIMINATING
323
FLAG SETTING
337
MESSAGE WRITING
335
MESSAGE DIS-CRIMINATING
333
FLAG SETTING
314
DATABASE MEMORY
324
DATABASE MEMORY
334
DATABASE MEMORY
306
306
306
306
306
306
306
306
306
306
392
LOG MEMORY
420

FIG.40

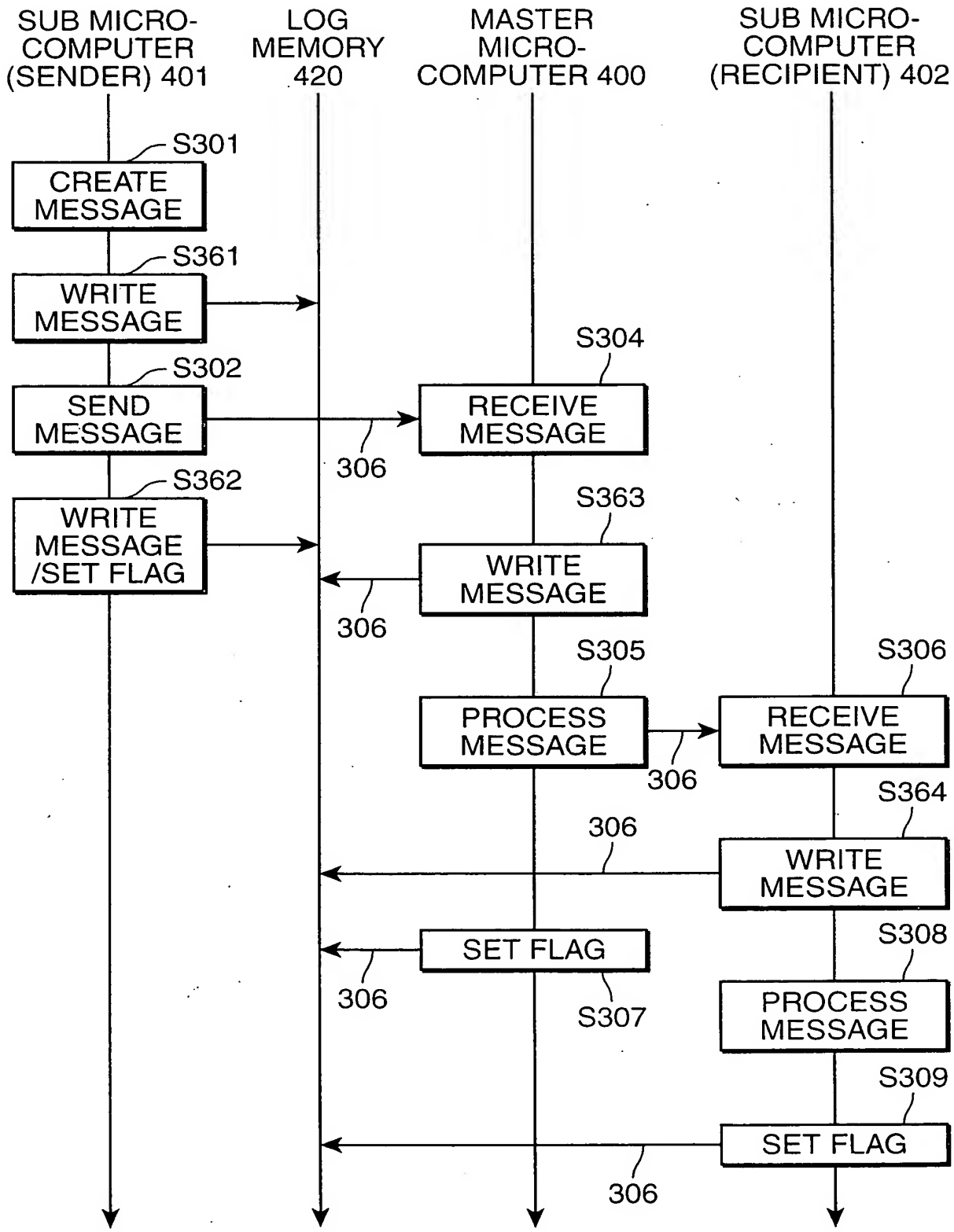

SUB MICRO-COMPUTER (SENDER) 401
LOG MEMORY 420
MASTER MICRO-COMPUTER 400
SUB MICRO-COMPUTER (RECIPIENT) 402
S301
CREATE MESSAGE
S361
WRITE MESSAGE
S302
SEND MESSAGE
S362
WRITE MESSAGE /SET FLAG
S304
RECEIVE MESSAGE
306
S363
WRITE MESSAGE
306
S305
PROCESS MESSAGE
306
S306
RECEIVE MESSAGE
S364
306
WRITE MESSAGE
SET FLAG
306
S307
S308
PROCESS MESSAGE
S309
SET FLAG
306

FIG.41

NOTIFICATION CONTENTS	SET CONDITION NOTIFICATION FLAG
NOTIFICATION OF SET CONDITION a	1
NOTIFICATION OF SET CONDITION b	0
NOTIFICATION OF SET CONDITION c	1

FIG.42

NOTIFICATION CONTENTS	STATUS NOTIFICATION FLAG
NOTIFICATION OF STATUS A	1
NOTIFICATION OF STATUS B	1
NOTIFICATION OF STATUS C	0

FIG.43

HEADER	MESSAGE CONTENTS	DATA